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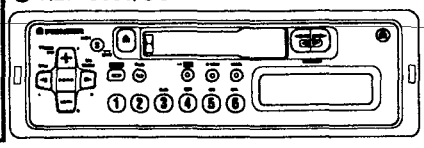
Service Manual

● KEH-3600/UC



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CRT1600

The chapter 1 of this Service Manual will not be reprinted. On your additional orders, we may supply only the chapter 2. For the chapter 1, please make copies and attach to the chapter 2 at your side if necessary.

CASSETTE CAR STEREO WITH FM/AM ELECTRONIC TUNER

KEH-3600 UC
KEH-3650 ES
KEH-490 UC
KEH-2600 UC
KEH-2650 ES
KEH-2403 UC

NOTE:

- **See the separate manual CX-197(CRT1328) for the cassette mechanism description.**
- **Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation. "Dolby" and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.**
- **The cassette mechanism assy employed in this model is one of X-1M series.**

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CHAPTER 1

SAFETY INFORMATION

(UC MODEL)

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer.
Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual.
Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty.
If you are not qualified to perform the repair of this product properly and safely; you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

Lead in solder used in this product is listed by the California Health and Welfare agency as a known reproductive toxicant which may cause birth defects or other reproductive harm (California Health & Safety Code, Section 25249.5).
When servicing or handling circuit boards and other components which contain lead in solder, avoid unprotected skin contact with the solder. Also, when soldering do not inhale any smoke or fumes produced.

1. SPECIFICATIONS

General

Power source ..... 14.4 V DC (10.8 — 15.6 V allowable)
Grounding system ..... Negative type
Max. current consumption ..... 5.6 A
Dimensions (chassis) ..... 178 (W) × 50 (H) × 150 (D) mm
[7(W) × 2(H) × 6-1/8(D) in.]
(front face) ..... 188 (W) × 58 (H) × 15 (D) mm
[6-3/4(W) × 1-7(H) × 3/8(D) in.]
Weight ..... 1.3 kg (2.9lbs.)

Amplifier

Continuous power output is 10 W per channel min. into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.
Maximum power output ..... 22 W × 4 (EIAJ)
Load impedance ..... 4Ω (4 — 8Ω allowable)
Preout output level/output impedance
..... 500 mV/1 kΩ
Tone controls (bass) ..... ±10 dB (100 Hz)
(treble) ..... ±10 dB (10 kHz)
Loudness contour ..... +10 dB (100 Hz), +7 dB (10 kHz)
(Volume: -30 dB)

Tape player

Tape ..... Compact cassette tape (C-30 — C-90)
Tape speed ..... 4.76 cm/sec.(+0.14 cm/sec.,-0.05 cm/sec.)
Fast forward/rewind time ..... Approx. 100 sec. for C-60
Wow & flutter ..... 0.13 % (WRMS)
Frequency response
(KEH-3600) ..... Metal: 40 — 17,000 Hz (±3 dB)
(KEH-2600) ..... 40 — 14,000 Hz (±3 dB)
Stereo separation ..... 45 dB
Signal-to-noise ratio
(KEH-3600) ..... Metal: Dolby B NR IN: 63 dB (IEC-A network)
Dolby NR OUT: 55 dB (IEC-A network)
(KEH-2600) ..... 52 dB (IEC-A network)

FM tuner

Frequency range ..... 87.9 — 107.9 MHz
Usable sensitivity ..... 11 dBf (1.0μV/75Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity ..... 16 dBf (1.7μV/75Ω, mono)
Signal-to-noise ratio ..... 70 dB (IEC-A network)
Distortion ..... 0.3% (at 65 dBf, 1 kHz, stereo)
Frequency response ..... 30 — 15,000 Hz (±3 dB)
Stereo separation ..... 40 dB (at 65 dBf, 1 kHz)
Selectivity ..... 70 dB(2ACA) (±400 kHz)
Three-signal intermodulation (desire signal level)
..... 50 dBf (two undesire signal level: 110 dBf)

AM tuner

Frequency range ..... 531 — 1,602 kHz
Usable sensitivity ..... 18μV (25 dB) (S/N: 20 dB)
Selectivity ..... 50 dB (±9 kHz)

These specifications were determined and are presented in accordance with specification standards established by the Ad Hoc Committee of Car Stereo Manufacturers.

Note:
Specifications and the design are subject to possible modification without notice due to improvements.

2. OPERATIONS AND CONNECTION

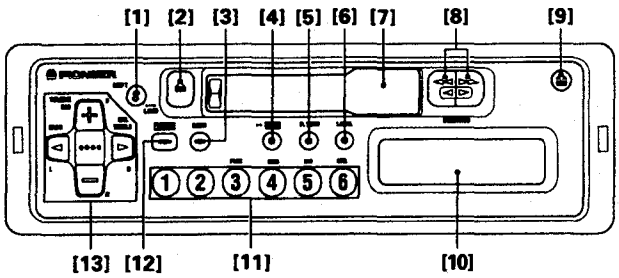


Fig. 1

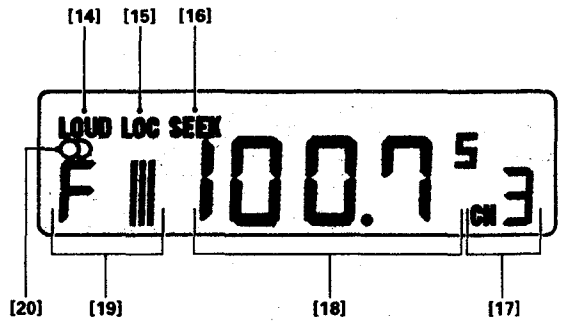


Fig. 2

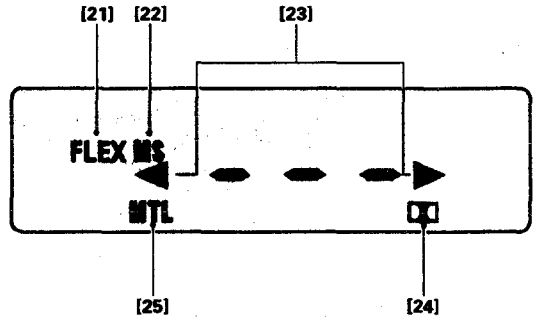


Fig. 3

Connection Diagram (Fig. 4)

1. Antenna jack
2. Rear out
3. White
4. Red
5. Connecting cords with RCA pin plugs (sold separetely)
6. Power amp (sold separetely)
7. Blue
8. Blue
   To system control terminal of the power amp or Auto-antenna relay control terminal (Max.300mA 12VDC).
9. Black (ground)
   To vehicle (metal) body.
10. Red
    To electric terminal controlled by ignition switch (12VDC) ON/OFF.
11. Orange
    To terminal always supplied with power regardless of ignition switch position.
12. Fuse resister
13. Fuse holder
14. With a 2 speaker system, connect to the 2 *speakers in the front or the rear.*
15. Use this for connections when you have the separately available amplifier.
16. Front/left speaker
17. Front/right speaker
18. *Rear/left speaker*
19. Rear/right speaker
20. Green
21. Gray
22. Green/black
23. Gray/black
24. Green/red
25. Gray/red
26. Black/green
27. Black/gray

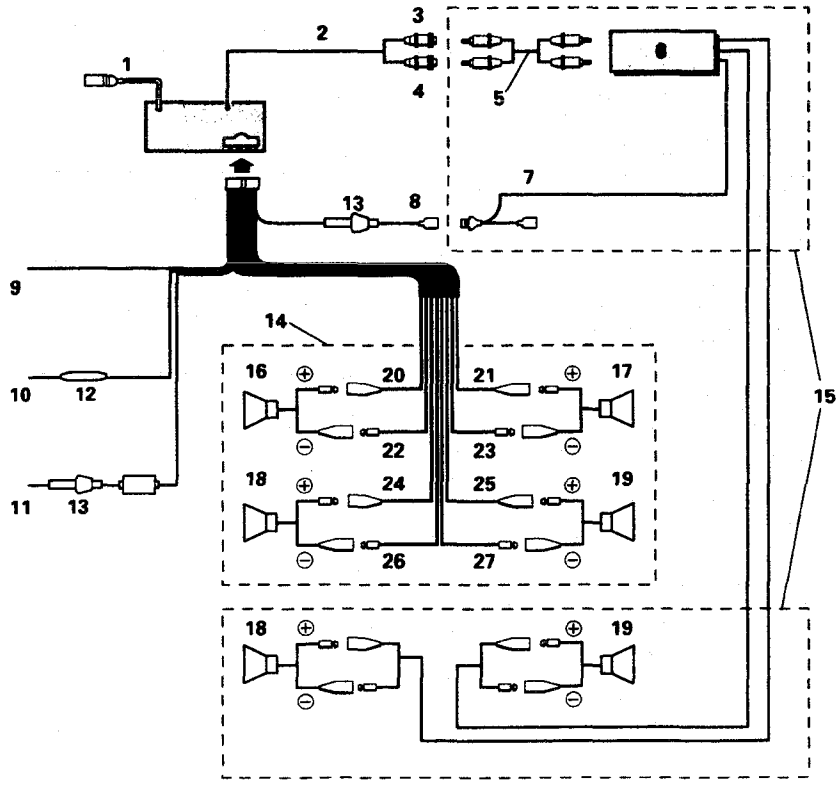


Fig. 4

Composition of Manual

This manual applies to the KEH-3600 and KEH-2600. However, the illustrations show the KEH-3600. The KEH-2600 have following features which differ to the KEH-3600.

KEH-2600

- The music search function is not available.
- The Dolby B NR function is not available.
- The tape selector function is not available.
- The FLEX (Frequency Level Expander) function is not available.

Adjusting Volume and Tone

Parts Identification

Fig. 1
[1] Shift
[2] Eject
[7] Cassette door
[10] Display
[12] Radio power switch
[13] Volume/Audio adjustment

Fig. 2
[14] Loudness

Switching Power On

Radio
Press button [12] to switch the tuner power on. Press button [12] again to switch the power off.

Tape
Insert the cassette tape through the cassette door [7], and the power will be automatically turned on to get the tape start being played back. To eject the tape, press the button [2].

Mode Selection

Each press of button [1] changes the mode as follows:
Volume adjustment (V:) → Balance adjustment (F: /B:) → Tone adjustment (B: /T:)

- When you are adjusting fader, balance, bass or treble settings, the indicator will stop at the center setting.
- Balance adjustment and tone adjustment modes will be canceled after about 8 seconds.

Volume Adjustment
Pressing the (+) side of button [13] increases the volume, while the (–) side decreases it.
(Display shows "V: 0" ~ "V: 31".)

- *When driving your vehicle, be sure to keep the volume of the unit set low enough to allow you to hear sounds coming from outside.*

Balance Adjustment
Press button [1] to select balance adjustment mode.
("F: " appears on the display.) Adjust the fader using the (+) or (–) side of button [13]. To adjust the balance, press either the (◄) or (►) side of button [13] to turn on "B: " and use the (◄) or (►) side of the button.

Fader
When you press the (+) side of button [13], the front speaker volume increases gradually while the rear speaker volume decreases. When you press the (–) side the button, the rear speaker volume increases gradually while the front speaker volume decreases.
(Display shows "F: F9" ~ "F: R9".)

- Please set "F: 0" when using 2 speaker system.

Balance
Pressing the (◄) side of button [13] shifts the balance to the left speaker, while the (►) side shifts it to the right speaker.
(Display shows "B: L9" ~ "B: R9".)

Tone Adjustment
Press button [1] to select tone adjustment mode. ("B: " appears.) Select the tone you wish to adjust using the (◄) or (►) side of button [13]. Pressing the (►) side boosts the T: (Treble) pressing the (◄) side boosts the B: (Bass).

Bass Adjustment
Select the Bass mode.
Pressing the (+) side of button [13] increases bass, while the (–) side decreases bass.
(Display shows "B: –6" ~ "B: 6".)

Treble Adjustment
Select Treble adjustment mode.
Pressing the (+) side of button [13] increases treble, while the (–) side decreases treble.
(Display shows "T: –6" ~ "T: 6".)

Loudness Select
This "loudness" function enhances both the high and low ranges of sound to give even more power to output even at low volume.
Hold down the button [1] for more than 2 seconds, the loudness function turns on.
(The "LOUD" [14] indicator appears on the display [10].)
Hold down the button [1] again for more than 2 seconds, the loudness function turns off.

Using the Radio

Parts Identification

Fig. 1
[3] Band
[4] Best Stations Memory (BSM)
[5] Present scan
[6] Local station
[10] Display
[11] Preset
[12] Radio power switch
[13] Tuning/Local seek sensitivity/Seek, Manual

Fig. 2
[15] Local station
[16] Seek
[17] Preset number
[18] Frequency
[19] Band
[20] FM stereo

Listening to the Radio

• **Electronic Tuner**

Frequency allocation differs depending upon the area. This unit has been designed in accordance with the frequency allocations for Western Europe, Asia, the Middle and Near East, Africa, Australia and Oceania. Use in other areas may result in improper reception of AM.

1. Press button [12] to switch the radio power on.

2. Press button [3] to select a band.

F1 → F2 → F3 → M/L

(FM1) (FM2) (FM3) (MW/LW)

Use the (◄) and (►) sides of button [13] to change between MW (531 – 1,602 kHz) and LW (153 – 281 kHz).

3. Use seek tuning to tune in a frequency.

Press the (►) side of button [13] to automatically tune in the next higher receivable frequency, and the (◄) side for a lower frequency.

4. Adjust volume and tone (see page 1-4).

5. Assign the tuned frequency to one of the buttons in Bank [11] (preset memory).

Press and hold down one of the buttons in Bank [11] for at least 2 seconds. The frequency is assigned to the selected button when the preset number [17] stops flashing on the display. Up to 18 FM stations (6 FM1 stations, 6 FM2 stations and 6 FM3 stations), and 6 MW/LW stations can be assigned to the preset memory.

6. Once a frequency is assigned to a button in Bank [11], you just need to press that button to tune it in.

This also causes the number of the button pressed to appear at position [17] on the display.

Adjusting Seek Sensitivity

The seek tuning function of this tuner lets you select between a local setting for reception of strong stations only, and a DX (distant) setting for reception of weaker stations. The local setting also has 4 seek tuning sensitivity levels for FM and 2 levels for MW/LW to match local conditions.

Changing the Local Seek Sensitivity

1. Use button [3] to select a band.
2. Hold down button [6] for more than 2 seconds, and the display will show you the current local seek sensitivity for about 5 seconds.
3. While the local seek sensitivity remains on the display, press the (►) side of button [13] to increase the sensitivity level, and the (◄) side to decrease the level as shown below:
   FM : L-1 = L-2 = L-3 = L-4
   MW/LW : L-1 = L-2
   The L-4 setting allows reception of only the strongest stations, while lower settings let you receive progressively weaker stations.

• The display of local seek sensitivity returns to the frequency when about 5 seconds have elapsed after the change of sensitivity.

Switching between Local and DX (distant)

Press button [6] to switch between Local and DX (distant) seek tuning.
When "LOC" [15] is shown on the display, seek tuning is performed with the local seek sensitivity. Otherwise, seek tuning is performed with the DX seek sensitivity.

Manual Tuning

Use manual tuning when stations are too weak to be picked up by seek tuning.

1. Press both (◄) and (►) sides of button [13] at the same time to clear "SEEK" [16].
2. Each press of the (►) side of button [13] increases the frequency in 50 kHz steps in the FM band, 9 kHz in the MW band and 1 kHz in the LW band. Pressing the (◄) side of button [13] decreases the frequency. Holding down either side of button [13] changes the frequency at high speed.

BSM (Best Stations Memory)

This function automatically locates stronger stations and automatically assigns their frequencies to the buttons in Bank [11], from strongest to weakest. It comes in handy when trying to find local stations while driving.

1. Press button [3] and select a band.
2. Holding down button [4] for about 2 seconds will start BSM search. At this time, "- - -" will flash on the display.
3. The frequency display will return once BSM search is complete, and frequencies are assigned to preset buttons.

• You can cancel BSM search by pressing button [4] again.

• *If there are fewer than 6 strong stations in the area, some of the preset buttons will not be assigned frequencies, so they will retain any frequencies assigned to them previously.*

• *BSM search may take as long as 30 seconds in areas where there are few strong stations.*

Preset Scan Tuning

This function lets you automatically monitor the stations assigned to the preset buttons.

1. Press the button [5], and the preset number [17] will flash.
   Each station assigned to the preset buttons will be automatically tuned in for about 8 seconds.
2. When you hear a station that you like, press button [5] again to cancel preset scan tuning and remain at that station.

Using the Tape Deck

Parts Identification

Fig. 1

[2] Eject
[7] Cassette door
[8] Fast forward, Rewind/Direction change
[10] Display
[11] ③ FLEX (Frequency Level Expander) (KEH-3600)
④ Dolby B NR (KEH-3600)
⑤ Music search (KEH-3600)
⑥ Metal (KEH-3600)

Fig. 3

[21] FLEX (Frequency Level Expander) (KEH-3600)
[22] Music search (KEH-3600)
[23] Direction
[24] Dolby B NR (KEH-3600)
[25] Metal (KEH-3600)

About Cassette Tapes

• *Do not use tapes longer than C-90-type (90 min.) cassettes. Longer tapes can interfere with tape transport.*

• *A loose or warped label on a cassette tape may interfere with the eject mechanism of the unit or cause the cassette to become jammed in the unit. Avoid using such tapes or remove such labels from the cassette before attempting use.*

- *Storing cassettes in areas directly exposed to sunlight or high temperatures can distort them and subsequently interfere with tape transport. (Fig. 5)*

Fig. 5

- *Store unused tapes in a tape case where there is no danger of them becoming loose or being exposed to dust.*

Cleaning the Head

If the playback head becomes dirty, sound quality will suffer. Periodically (once or twice a month) clean the head with a cotton swab soaked with alcohol. (Fig. 6)

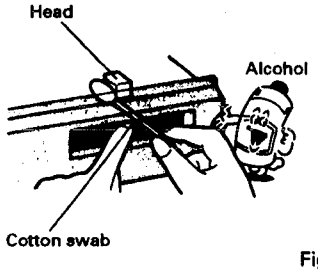


Fig. 6

Listening to a Tape

1. By inserting the cassette tape into slot [7], power will be turned on and the tape will begin to play.

At this time, the tape running direction indicator [23] will light up to your satisfaction.

2. Adjust volume and tone (see page 1-4).

3. To eject the cassette, press button [2].

- *Do not try to eject the cassette immediately after insertion, as it may result in malfunction. Wait a few seconds.*
- *Be sure to eject the tape when the front panel is removed, or the vehicle's ignition is turned OFF. Leaving the tape in the unit can deform the pinch roller causing wow and flutter during tape playback.*
- *Loose tapes should be rewound with the aid of a pencil and unevenly wound tapes rewound with the use of the fast forward function.*

Changing Program

Push the fast forward and rewind buttons [8] together to switch from one side of the tape to the other (from Side A to Side B or vice versa).

Dolby B NR (KEH-3600)

To hear a tape recorded using a Dolby NR system, press button ④ of Bank [11]. ("DD" [24] appears.)

- Dolby noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.
  "DOLBY" and the double-D symbol DD are trademarks of Dolby Laboratories Licensing Corporation.

Tape Selector (KEH-3600)

When using metal tapes and chrome tapes, press button ⑥ of Bank [11]. ("MTL" [25] appears.)

Using Fast Forward and Rewind

Since the transport can be in either direction, both the left and right high-speed tape transport buttons [8] can be regarded as fast forward/rewind buttons.

For fast forward, press the high-speed tape transport button [8] that corresponds to the direction that is shown by the direction indicator [23]. When the end of the tape is reached, playback will automatically begin from the opposite side of the tape (Auto-reverse).

For rewind, press the button [8] that is opposite that of the direction shown by the direction indicator [23]. When the end of the tape is reached, playback will automatically begin from the beginning of the same side of the tape (Auto-replay).

When you release fast forward/rewind, lightly press button [8] located on the opposite side of the one you pressed to fast forward or rewind.

- " ◂- - - ▸ " will flash when the tape is fast forwarding or rewinding.

Using Music Search (KEH-3600)

Returning to the beginning of selection A

Press button ⑤ of Bank [11] ("MS" [22] appears) and then the high-speed tape transport button [8] for the direction opposite that is shown by the direction indicator [23]. Playback will automatically start from the beginning of selection A.

Moving from selection A to selection B

Press button ⑤ of Bank [11] ("MS" [22] appears) and then the high-speed tape transport button [8] that corresponds to the direction shown by the direction indicator [23]. Playback will automatically start from the beginning of selection B.

To enable regular fast forward/rewind operations, press the button ⑤ of Bank [11] again ("MS" [22] turns off) to turn the function OFF.

The following errors will cause the music search function to operate improperly, even though the unit is not malfunctioning. (Fig. 7)

- *Unrecorded "blank" portions between selections less than 4 seconds → the blank portion cannot be detected by the unit.*
- *Pauses in recorded conversations longer than 4 seconds → the unit reads these as blanks between selections.*
- *Portions recorded at very low volume for more than 4 seconds → the unit reads these as blanks between selections.*

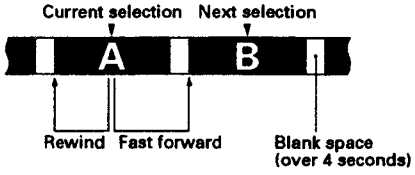


Fig. 7

FLEX (Frequency Level Expander) (KEH-3600)

If the high-frequency performance is poor when playing back an old or poorly recorded cassette, you can improve it by pressing button ③ in bank [11]. ("FLEX" [21] appears.)

- *This function may have little effect on a cassette offering good sound quality—for instance, one recorded from compact disc.*

3. DISASSEMBLY

● Removing the Case(not shown)

1. Remove the screw and, then remove the case.

● Removing the Cassette Mechanism Assy(not shown)

1. Remove the four screws.
2. Disconnect the connector.
3. Remove the cassette mechanism assy.

● Removing the Detach Grille Assy(Fig.8)

1. Disconnect the two stoppers indicated by arrows.
2. Remove the detach grille assy.

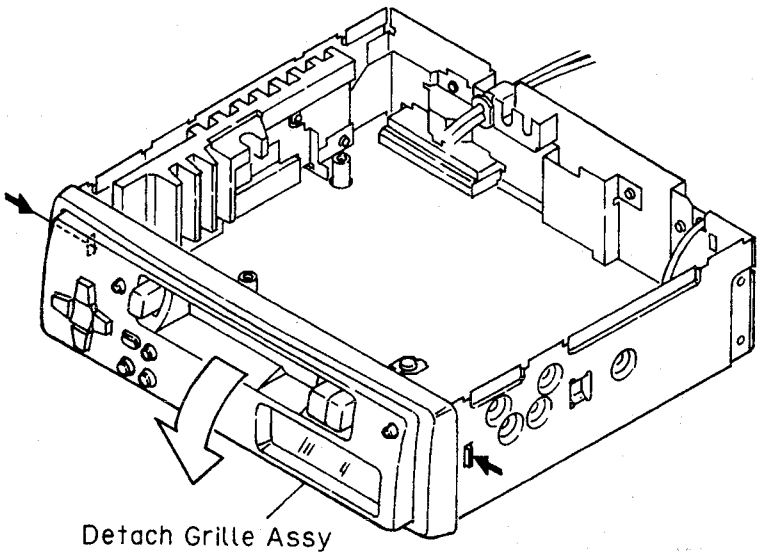


Fig.8

● Removing the Chassis Unit(Fig.9)

1. Remove the screw A , three screws B and three screws C.
2. Unbend the tabs at two locations indicated by arrows until straight.
3. Remove the chassis unit.

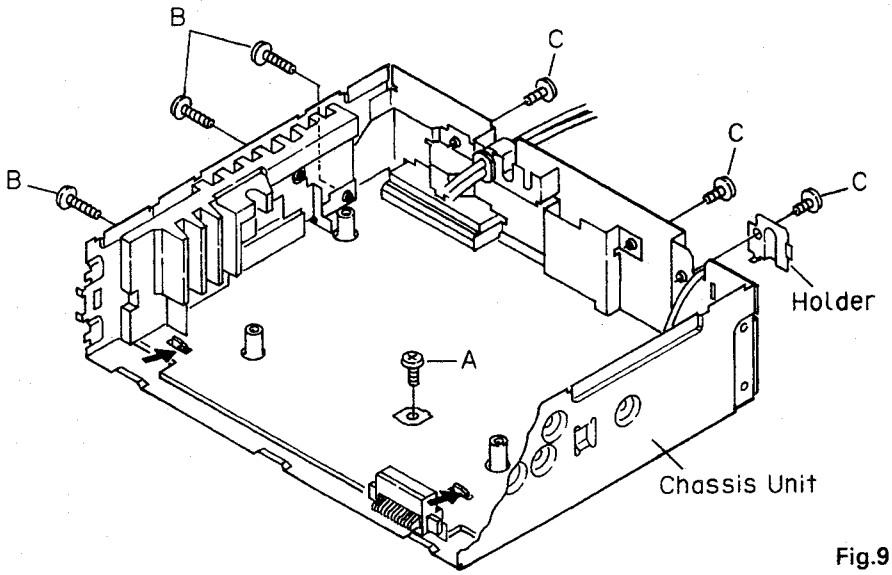


Fig.9

4. ADJUSTMENT

● Connection Diagram

NOTE:

Select C1 so that total capacity of 80pF is attained from the direction of the receiver jack.

Z: Output impedance of SSG.

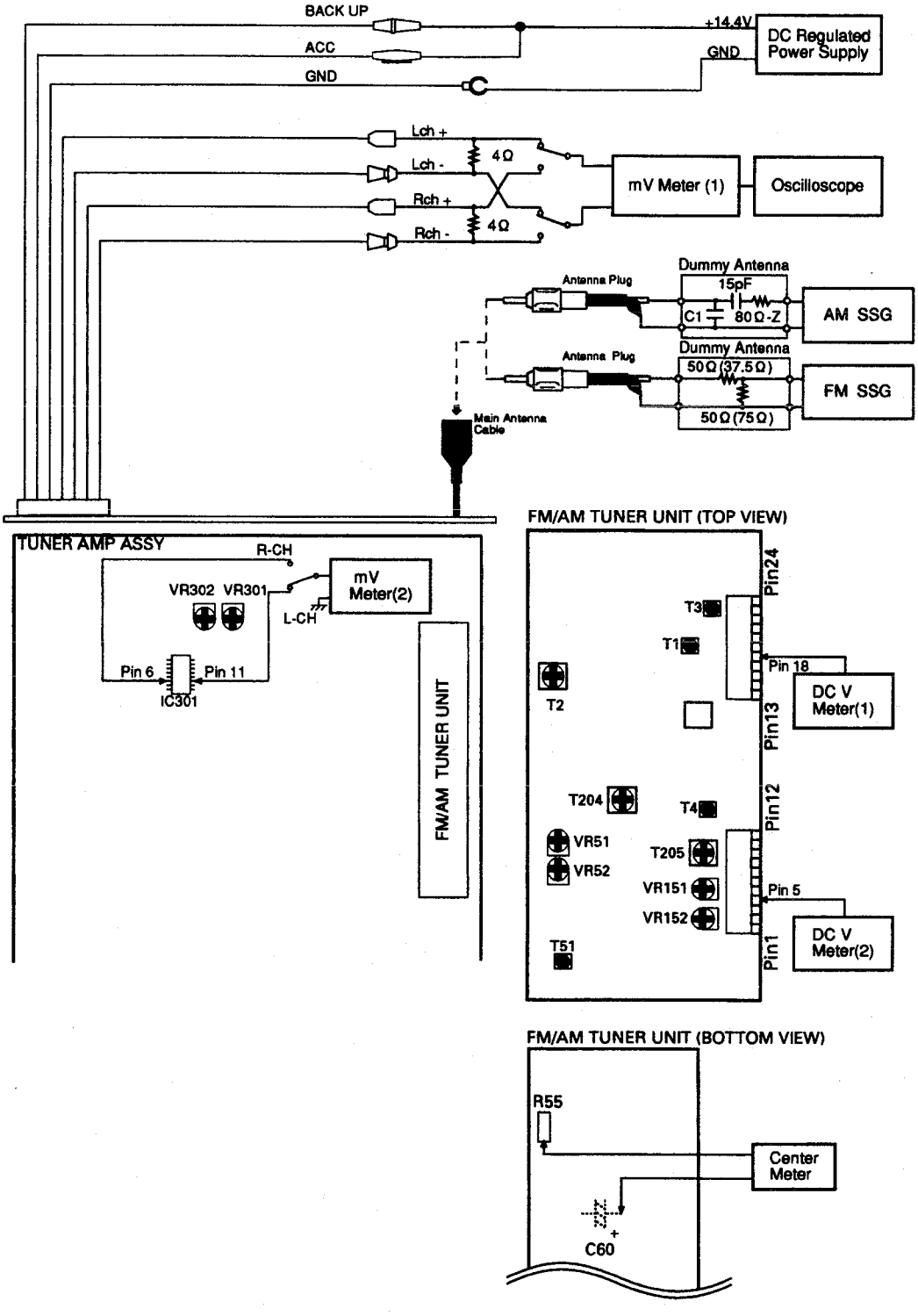


Fig.10

AM ADJUSTMENT (999) : ES Model tuning steps at 9 kHz

	No.	AM SSG(400Hz,30%) Frequency(kHz)	AM SSG(400Hz,30%) Level(dBμV)	Displayed Frequency(kHz)	Adjustment Point	Adjustment Method (Switch Position)
IF	1	1,000(999)	20	1,000(999)	T204,T205	mV Meter(1) : Maximum

FM ADJUSTMENT (108) : ES Model

Modulation M:MONO MOD., 400Hz 100%(75kHz Dev.)
S:STEREO MOD., 1kHz, L or R=90%, Pilot=10%(67.5kHz+7.5kHz Dev.)

NOTE:Before proceeding to further adjustments after switching power ON, let the tuner run for ten minutes to allow the circuits to stabilize.

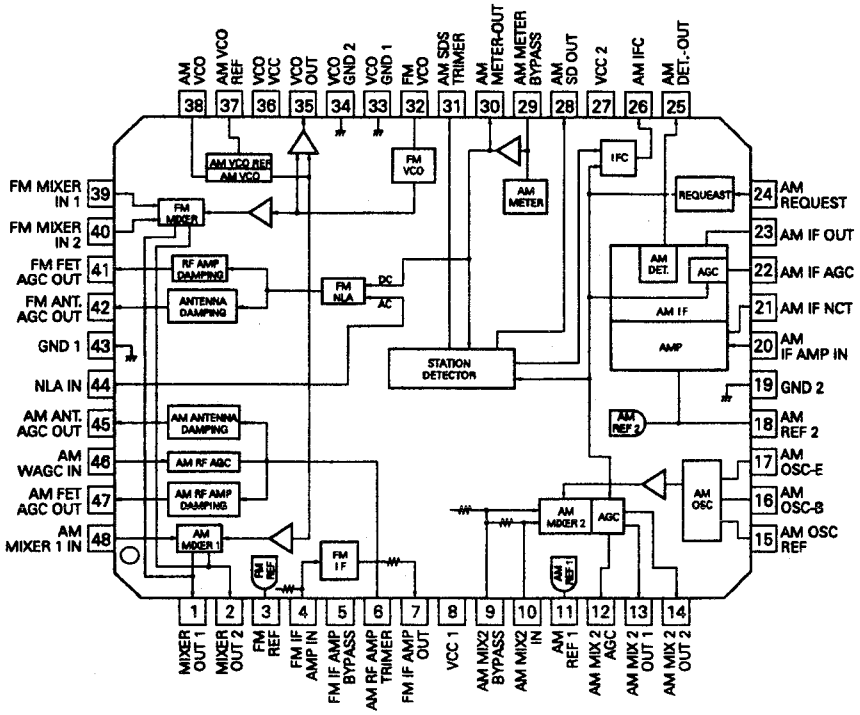
	No.	FM SSG Frequency(MHz)	FM SSG Level(dBf)	Displayed Frequency(MHz)	Adjustment Point	Adjustment Method (Switch Position)
TUN Volt	1	107.9 M (108.0)	65	107.9(108.0)	T4	DC V Meter(1) : 6.5V±0.1V
IF	1	98.1 M	65	98.1	T51	Center Meter : 0
ANT,RF	1	98.1 M	10	98.1	T1,T3	mV Meter(1) : Maximum
IFT	1	98.1 M	10	98.1	T2	mV Meter(1) : Maximum (STEREO MODE)
Soft Mute	1	98.1 M	65	98.1		mV Meter(1) : A (STEREO MODE)
	2	98.1 M	15	98.1	VR52	mV Meter(1) : A-3dB
MPX	1	98.1 S	65	98.1	VR152	mV Meter(1) : Separation Maximum
ARC	1	98.1 S	40	98.1	VR151	mV Meter(1) : Separation 5dB
SD	1	98.1 S	22	98.1	VR51	DC V Meter(2) : Approx. 5V

DOLBY NR ADJUSTMENT(KEH-3600/UC,3650/ES)

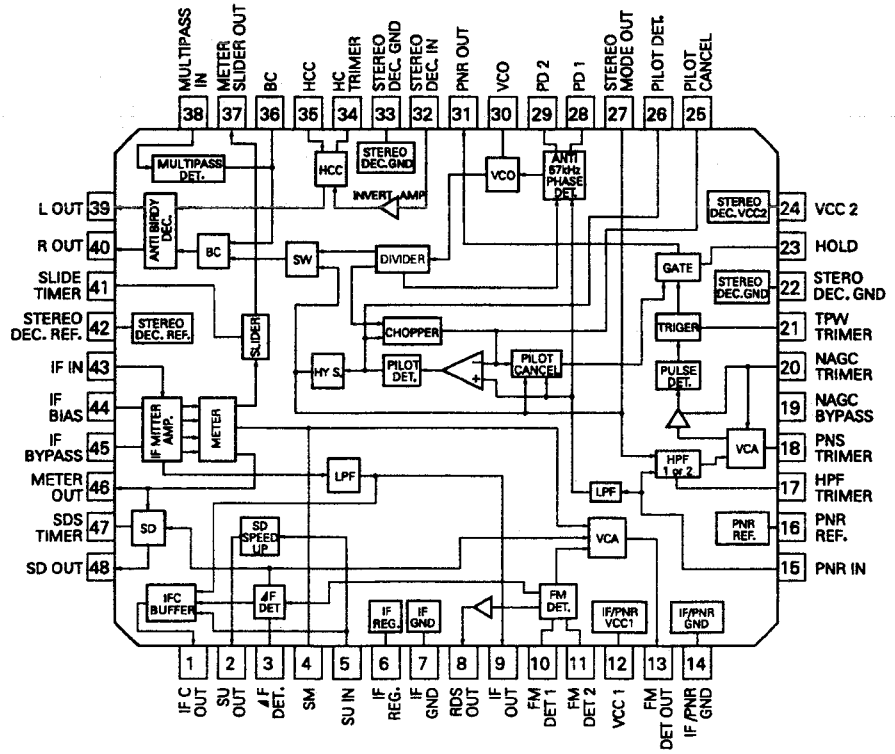
No.	Test Tape	Adjustment Point	Adjustment Method (Switch Position)
1	NCT-150(400Hz,100%)	VR301(Lch),VR302(Rch)	mV Meter(2) : -8.2dBs±1dB (DOLBY NR Switch : OFF)

● ICs

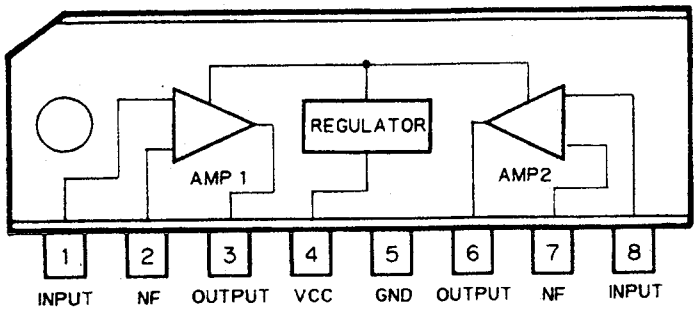
PA2021B


AM VCO 38
AM VCO REF 37
VCO VCC 36
VCO OUT 35
VCO GND 2 34
VCO GND 1 33
FM VCO 32
AM SDS TRIMER 31
AM METER-OUT 30
AM METER BYPASS 29
AM SD OUT 28
VCC 2 27
AM IFC 26
AM DET.-OUT 25
FM MIXER IN 1 39
FM MIXER IN 2 40
FM FET AGC OUT 41
FM ANT. AGC OUT 42
GND 1 43
NLA IN 44
AM ANT. AGC OUT 45
AM WAGC IN 46
AM FET AGC OUT 47
AM MIXER 1 IN 48
AM REQUEST 24
AM IF OUT 23
AM IF AGC 22
AM IF NCT 21
AM IF AMP IN 20
GND 2 19
AM REF 2 18
AM OSC-E 17
AM OSC-B 16
AM OSC REF 15
MIXER OUT 1 1
MIXER OUT 2 2
FM REF 3
FM IF AMP IN 4
FM IF AMP BYPASS 5
AM RF AMP TRIMER 6
FM IF AMP OUT 7
VCC 1 8
AM MIX2 BYPASS 9
AM MIX2 IN 10
AM REF 1 11
AM MIX 2 AGC 12
AM MIX 2 OUT 1 13
AM MIX 2 OUT 2 14

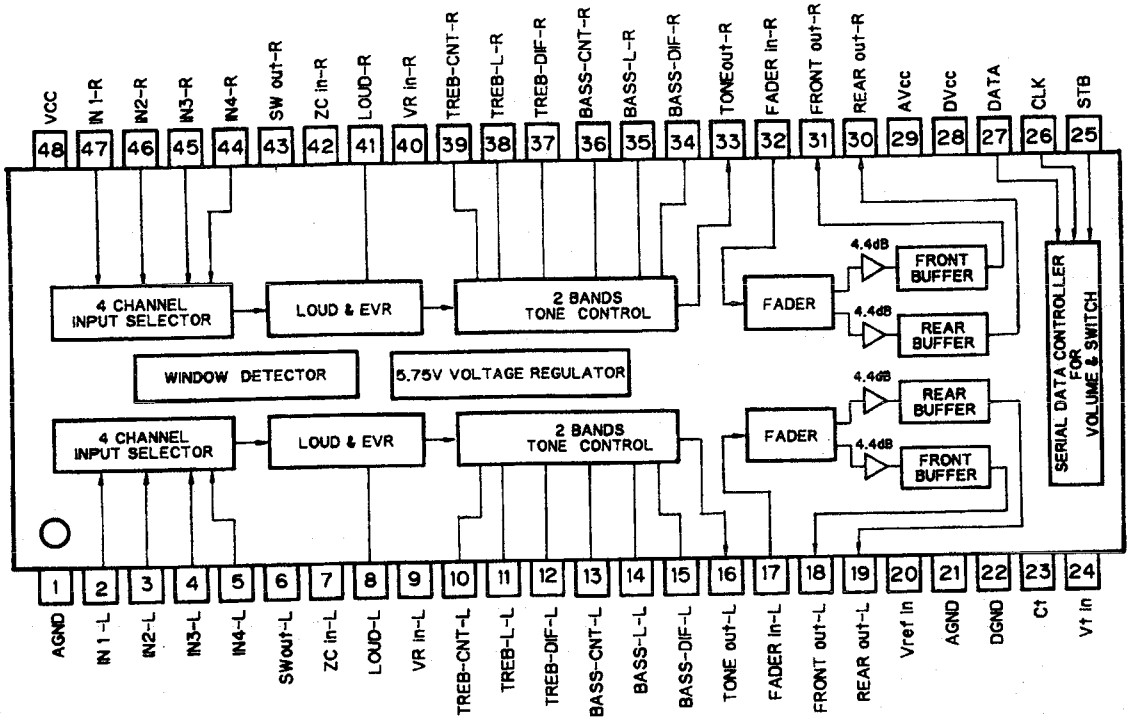
PA2022A



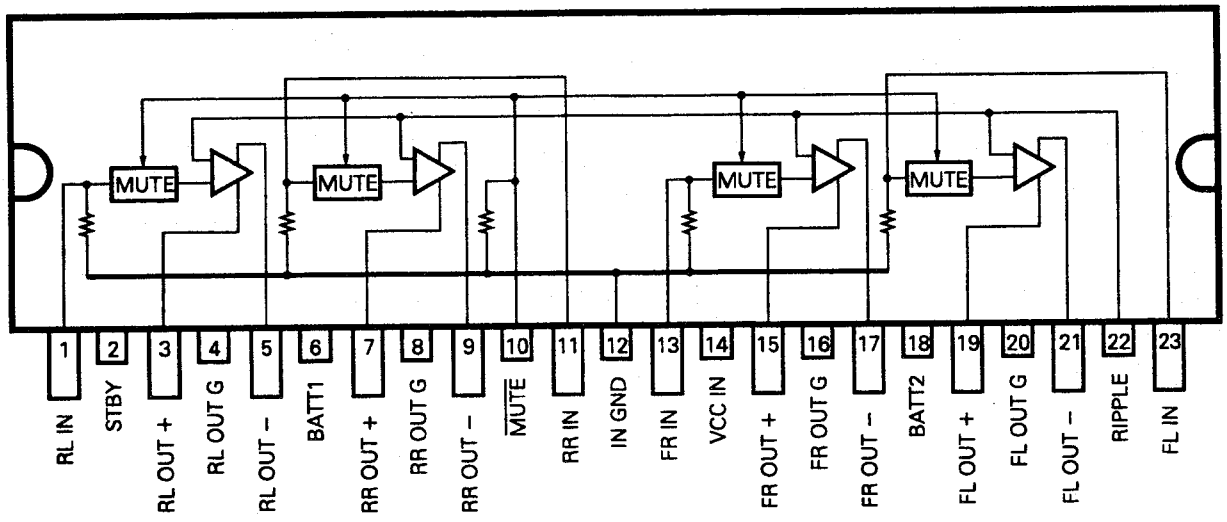
LA3161P



SN761025DL


VCC IN 1-R IN2-R IN3-R IN4-R SW out-R ZC in-R LOUD-R VR in-R TREB-CNT-R TREB-L-R TREB-DIF-R BASS-CNT-R BASS-L-R BASS-DIF-R TONEout-R FADER in-R FRONT out-R REAR out-R AVcc DVcc DATA CLK STB
48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25
4 CHANNEL INPUT SELECTOR
LOUD & EVR
2 BANDS TONE CONTROL
FADER
4.4dB
FRONT BUFFER
4.4dB
REAR BUFFER
WINDOW DETECTOR
5.75V VOLTAGE REGULATOR
SERIAL DATA CONTROLLER FOR VOLUME & SWITCH
4 CHANNEL INPUT SELECTOR
LOUD & EVR
2 BANDS TONE CONTROL
FADER
4.4dB
REAR BUFFER
4.4dB
FRONT BUFFER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
AGND IN1-L IN2-L IN3-L IN4-L SWout-L ZC in-L LOUD-L VR in-L TREB-CNT-L TREB-L-L TREB-DIF-L BASS-CNT-L BASS-L-L BASS-DIF-L TONE out-L FADER in-L FRONT out-L REAR out-L Vref in AGND DGND Ct Vt in

PA3029A



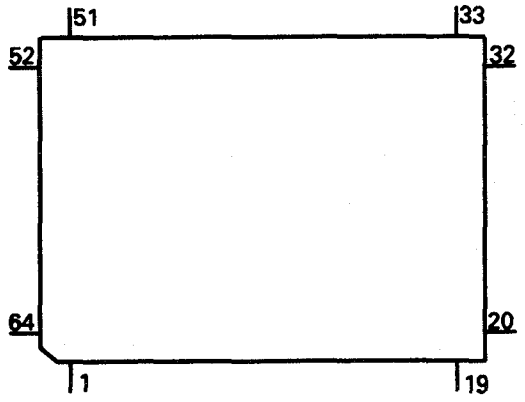
● **Pin Functions (PD4502A)**

Pin No.	Pin Name	I/O	I/O Format	Function and Operation
1	MCMUT	I	C	Cassette mechanism mute input
2	TAPLD	I	C	Tape loading input
3	EO		C	
4	VDD1			Power supply
5	GND	I		GND
6	VCOIN	I		AM/FM VCO IN
7	CE	I		Chip enable input
8	VDD2			Power supply
9	LCK	I/O	C	Clock out
10	LDT	O	C	Data out
11	LDI	I	C	Data in
12	FMSD	I		FM SD IN
13	AMIF	I		AM IF IN(450KHz)
14	SL	I		Input level detect
15	ST	I		Stereo input
16	SK	I	C	SK signal input
17	DK	I	C	DK signal input
18	SWVDD	O	C	Grille power
19	NC			N.C
20	VST	O	C	Strobe pulse output for electronic volume
21	VCK	O	C	Clock output for electronic volume
22	VDT	O	C	Data output for electronic volume
23	N.C	O	C	N.C
24	XOUT		C	Crystal oscillator connection pin
25	XIN			Crystal oscillator connection pin
26	GND	O		GND
27–30	N.C	O	N	N.C
31	TEST	I	C	Test program mode input
32	DSENS	I	C	Detach sense input
33,34	GND	I	C	GND
35–38	N.C	O	C	N.C
39	MUTE	O	C	System mute
40	N.C			N.C
41	ILLPW	O	C	Illumination power output
42	AUTANT	O	C	Antenna output/B.REMOTE output
43	SYSPW	O	C	System power supply control output
44,45	N.C	O	C	N.C
46	FLEX	O	C	FLEX output
47	NR	O	C	NR output
48	MTL	O	C	METAL output
49	MS	O	C	Cassette mechanism MS sense input
50	MECPW	O	C	Cassette mechanism power output
51	AMPW	O	C	AM output
52	LOCL	O	C	Local "L" set up
53	LOCH	O	C	Local "H" set up
54	FM/AM	O	C	FM output
55	SEEK	O	C	Seek output
56	N.C	O	C	N.C
57	LW	O	C	LW output
58	GND			
59–62	DM3-DM0	I		Destination•function input
63	NOR/REV	I	C	Tape running input
64	GND			GND

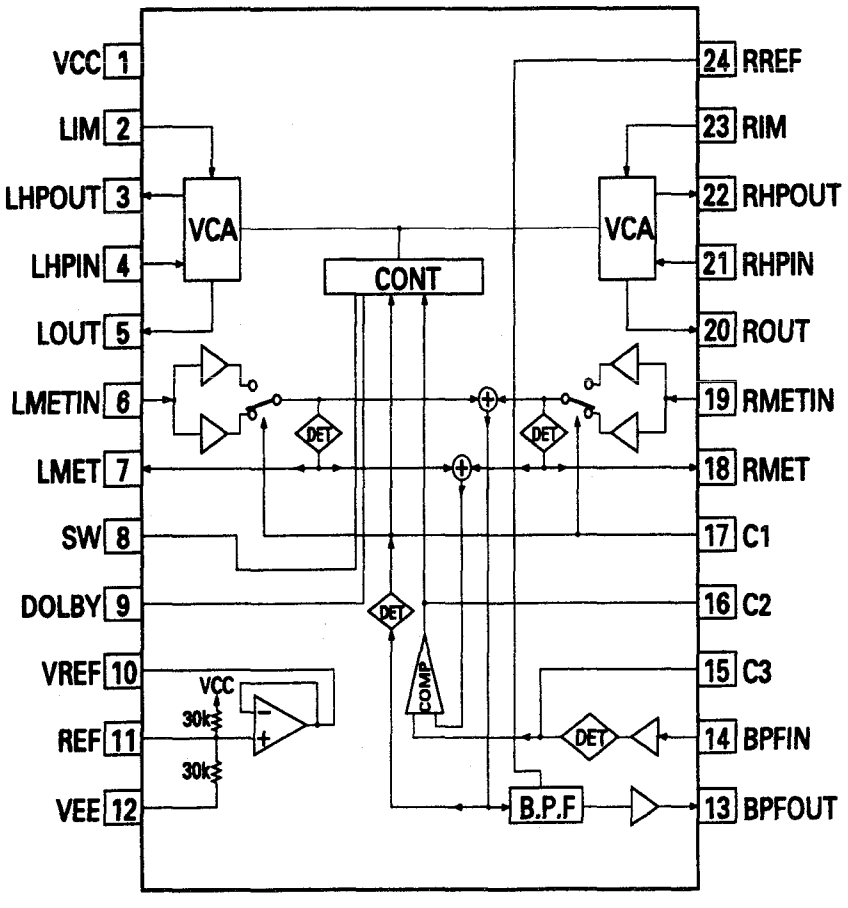
I/O Format	Meaning
C	C MOS output
N	N channel open drain

IC's marked by are MOS type.*
Be careful in handing them because they are very liable to be damaged by electrostatic induction.

*PD4502A



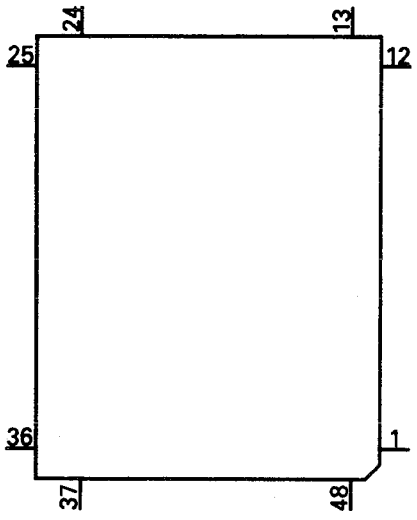
PA0059AM



Pin Functions (PDC015B)

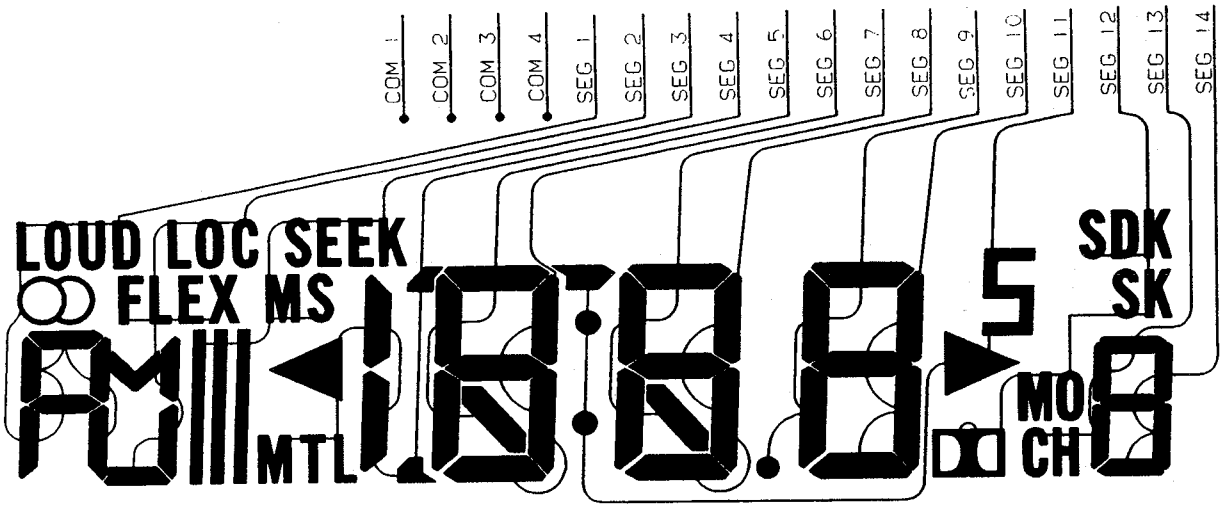
Pin No.	Pin Name	I/O	Function and Operation
1–4	NC		Not used
5–8	KS4-1	O	RAM data output
9–12	KD4-1	I	Input port
13	SI	I	Serial data input
14	SO	O	Serial data input terminal
15	SCK	I	Clock input terminal serial data input
16	REM	I	Remote control reception
17	RES	I	Reset input
18	TEST	I	Test terminal
19	OSCIN	I	System clock
20	OSCOUT	O	System clock
21	GND		GND
22	VDD2		Device power supply terminal
23	VDD1		Device power supply terminal
24	VDD		Power supply
25–28	COM1-4	O	COMMON output
29–42	SEG1-14	O	LCD drive output
43–48	NC		Not used

*PDC015B



● **LCD(CAW1237)**

SEGMENT



COMMON

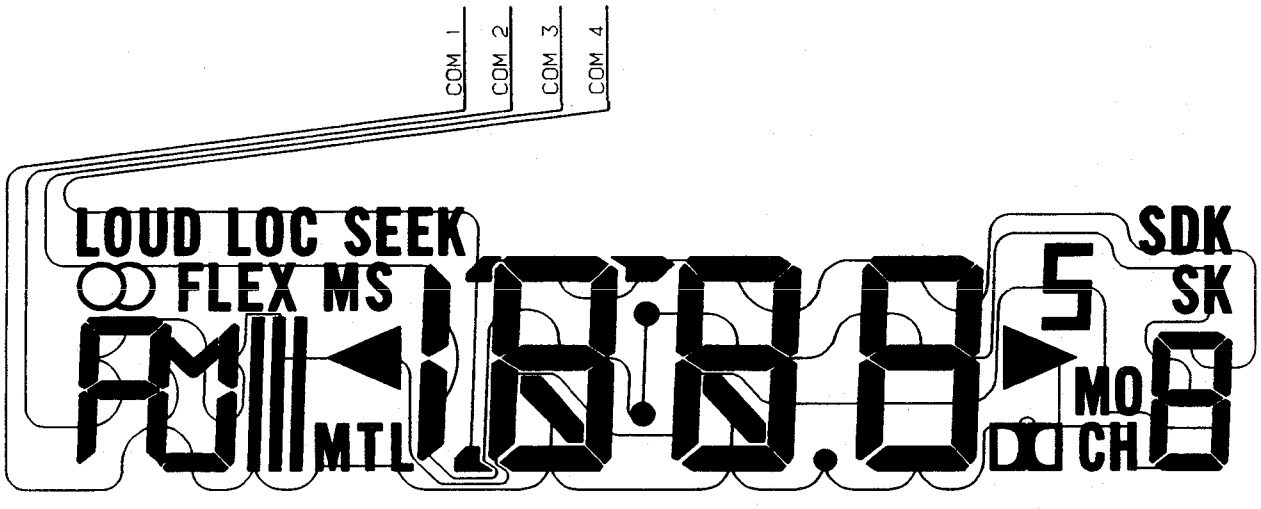


Fig.11

5. EXPLODED VIEW PARTS LIST

NOTE:

- Parts marked by "*" are generally unavailable because they are not in our Master Spare Parts List.
- Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- **Chassis(Exploded View:Page 2-22)**

- **Parts List(KEH-3600/UC)**

Mark	No.	Description	Part No.
	1	Screw	BSZ26P050FMC
	2	Screw	BSZ30P120FMC
	3	Button	CAC2819
	4	Button	CAC2820
	5	Cord Assy	CDE4326
	6	Cap	CNS1472
	7	Resistor	RS1/2P102JL
	8	Case	CNB1755
	9	Holder	CNC4946
	10	·····	
	11	·····	
	12	Cap	CNV2680
	13	Tuner Amp Assy	CWM3803
◉	14	Cassette Mechanism Assy	EXK1726
	15	Handle	CNC4947
	16	Screw	CBA1284
	17	Bush	CNV1009
	18	Screw	BSZ30P055FUC
	19	Screw	BSZ30P060FMC
	20	Screw	BSZ30P120FMC
	21	Holder	CNC4963
	22	Insulator	CNM3884
	23	Insulator	CNM3896
	24	Chassis Unit	CXA6273
	25	Detach Grille Assy	CXA6236
	26	Connector(CN604)	CDE4251
	27	Cord	CDE4328
	28	Antenna Cable	CDH1187
	29	Clamper	CEF1005
	30	Plug(CN601)	CKM1139
	31	Plug(CN851)	CKS1224
	32	Connector(CN902)	CKS2884
	33	Holder	CNC2218
	34	FM/AM Tuner Unit	CWE1312
	35	Screw	BPZ20P120FZK

Mark	No.	Description	Part No.
	36	Button	CAC3698
	37	Button	CAC3699
	38	Button	CAC3700
	39	Button	CAC3876
	40	Button	CAC3877
	41	Spring	CBH1571
	42	Spring	CBH1572
	43	Cover	CNS2929
	44	Grille	CNS2935
	45	Key Board Unit	CWM3833
	46	Screw	BPZ20P080FMC
	47	Door	CAT1575
	48	Screw	CBA1215
	49	Screw	CBA1271
	50	Spring	CBH1215
	51	Spring	CBH1566
	52	Spring	CBH1658
	53	Holder	CNC5348
	54	Panel	CNS2931
	55	Arm	CNV3654
	56	Arm	CNV3655
	57	Arm	CNV3750
	58	Holder Unit	CXA5779
	59	Screw	BSZ30P100FMC
	60	Holder	CNC4956
	61	Holder	CNC5026
	62	Heat Sink	CNR1308
	63	Connector(CN901)	CKS2883
	64	Holder	CNC5147
	65	Lens	CNV3749
	66	Antenna Jack	CKX1043
	67	Holder	CNC4880
	68	LCD(LCD901)	CAW1237
	69	IC(IC551)	PA3029A
	70	Transistor(Q959)	2SD1684
	71	Spring	CBH-865
	72	Panel	CNS2786

• The KEH-3650/ES, KEH-490/UC, KEH-2600/UC, KEH-2650/ES and KEH-2403/UC Parts Lists enumerate the parts which differ from those enumerated in the KEH-3600/UC Parts List only. The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly. The KEH-3600/UC Parts List is given on page 1-16.

Mark	No.	Description	KEH-3600 /UC Part No.	KEH-3650 /ES Part No.	KEH-490 /UC Part No.	KEH-2600 /UC Part No.	KEH-2650 /ES Part No.	KEH-2403 /UC Part No.
	13	Tuner Amp Assy	CWM3803	CWM3804	CWM3807	CWM3808	CWM3809	CWM3808
◉	14	Cassette Mechanism Assy	EXK1726	EXK1726	EXK1726	EXK1716	EXK1716	EXK1716
	25	Detach Grille Assy	CXA6231	CXA6232	CXA6236	CXA6237	CXA6238	CXA6629
	26	Connector(CN604)	CDE4251	CDE4251	CDE4251	CDE4252	CDE4252	CDE4252
	44	Grille	CNS2999	CNS3000	CNS2935	CNS3004	CNS3057	CNS3058
	45	Key Board Unit	CWM3833	CWM3833	CWM3833	CWM3833	CWM3833	CWM3831

● Cassette Mechanism Assy(Exploded View:Page 2-23)

● Parts List(KEH-3600/UC,KEH-3650/ES,KEH-490/UC)

Mark No.	Description	Part No.
1	Reel Unit	EXA1308
2	Gear Unit	EXA1206
3	Washer	CBF1037
4	•••••	
5	Gear	ENV1372
6	Gear	ENV1344
7	Gear	ENV1374
8	Gear	ENV1373
9	Sub Chassis Unit	EXA1300
10	Arm	ENV1375
11	Screw	BMZ20P025FMC
12	Spring	EBH1381
13	•••••	
14	•••••	
15	Shaft	ELA1266
16	Lever	ENC1275
17	Washer	EBF1015
18	Gear	ENV1342
19	Spring	EBH1462
20	Spring	EBH1362
21	Lever	ENC1302
22	Spring	EBH1359
23	Washer	YE25FUC
24	Spring	EBH1480
25	•••••	
26	Lever	ENC1256
27	Spring	EBH1373
28	Arm	ENC1248
29	Spring	EBH1308
30	Washer	YE15FUC
31	Arm Unit	EXA1198
32	Spring	EBH1374
33	Frame	ENC1204
34	Arm	ENC1263
35	•••••	
36	Holder	ENC1257
37	Spring	EBH1364
38	Lever	ENV1287
39	Head Base Unit	EXA1271
40	•••••	
41	Spring	EBH1363
42	Motor Unit	EXA1304
43	Screw	PMS26P025FUC
44	Screw	CBA1054
45	Gathering P.C.Board	ENX1005
46	Switch	ESH1004
47	Switch	CSN1005
48	Screw	CBA1025
49	Gear	ENV1267
50	•••••	
51	•••••	
52	Gear	ENV1343
53	Arm Unit	EXA1302
54	Washer	YE30FUC
55	Spring	EBH1310
56	Flywheel Unit	EXA1257
57	Belt	ENT1018
58	Arm	ENV1408
59	Spring	EBH1317
60	Gear	ENV1409
61	Chassis Unit	EXA1267
62	Screw	JFZ20P025FNI
63	Bracket	ENC1341
64	Pulley	ENV1291
65	Solenoid	EXP1010
66	Screw	EBA1023
67	Plug	CKS1055
68	Gathering P.C.Board	ENX1004
69	Switch	ESH1003
70	Washer	EBE1012
71	Screw	BSZ23P050FMC
72	Screw	EBA1028
73	Head Unit	EXA1163
74	P.C.Board	ENP1132
75	Switch	ESN1014
76	Washer	YE20FUC
77	Pinch Roller Unit	EXA1355
78	Washer	YE12FUC
79	Roller	ELA1250
80	Arm Unit	EXA1166
81	Screw	CBA1038
82	Arm	ENV1426
83	Spring	EBH1368
84	Arm	ENC1340
85	Spring	EBH1322
86	Lever	ENC1246
87	Spring	EBH1481
88	Lever	ENC1247
89	Arm Unit	EXA1158
90	Pinch Roller Unit	EXA1350

Mark No.	Description	Part No.
91	Spring	EBH1375
92	Arm Unit	EXA1157
93	Spring	EBH1345
94	Cord	EDD1010

● **Cassette Mechanism Assy(Exploded View:Page 2-25)**

● **Parts List(KEH-2600/UC,KEH-2650/ES,KEH-2403/UC)**

Mark No.	Description	Part No.
1	Reel Unit	EXA1308
2	Gear Unit	EXA1206
3	Washer	CBF1037
4	•••••	
5	Gear	ENV1372
6	Gear	ENV1344
7	Gear	ENV1374
8	Gear	ENV1373
9	Sub Chassis Unit	EXA1300
10	Arm	ENV1375
11	Screw	BMZ20P025FMC
12	Spring	EBH1381
13	•••••	
14	•••••	
15	Shaft	ELA1266
16	Lever	ENC1275
17	Washer	EBF1015
18	Gear	ENV1342
19	Spring	EBH1462
20	Spring	EBH1362
21	Lever	ENC1302
22	Spring	EBH1359
23	Washer	YE25FUC
24	Spring	EBH1480
25	•••••	
26	Lever	ENC1256
27	Spring	EBH1373
28	Arm	ENC1248
29	Spring	EBH1308
30	Washer	YE15FUC
31	Arm Unit	EXA1198
32	Spring	EBH1374
33	Frame	ENC1204
34	Arm	ENC1263
35	•••••	

Mark No.	Description	Part No.
36	Holder	ENC1257
37	Spring	EBH1364
38	Lever	ENV1287
39	Head Base Unit	EXA1271
40	•••••	
41	Spring	EBH1363
42	Motor Unit	EXA1304
43	Screw	PMS26P025FUC
44	Screw	CBA1054
45	Gathering P.C.Board	ENX1005
46	Switch	ESH1004
47	Switch	CSN1005
48	Screw	CBA1025
49	Gear	ENV1267
50	•••••	
51	•••••	
52	Gear	ENV1343
53	Arm Unit	EXA1302
54	Washer	YE30FUC
55	Spring	EBH1310
56	Flywheel Unit	EXA1257
57	Belt	ENT1018
58	Arm	ENV1408
59	Spring	EBH1317
60	Gear	ENV1409
61	Chassis Unit	EXA1267
62	Screw	JFZ20P025FNI
63	•••••	
64	Pulley	ENV1291
65	•••••	
66	•••••	
67	Plug	CKS1055
68	Gathering P.C.Board	ENX1004
69	Switch	ESH1003
70	Washer	EBE1012

Mark No.	Description	Part No.
71	Screw	BSZ23P050FMC
72	Screw	EBA1028
73	Head Unit	EXA1163
74	P.C.Board	ENP1132
75	Switch	ESN1014
76	Washer	YE20FUC
77	Pinch Roller Unit	EXA1355
78	•••••	
79	•••••	
80	Arm	ENC1213
81	Screw	CBA1038
82	Arm	ENV1426
83	Spring	EBH1368
84	Arm	ENC1340
85	Spring	EBH1481

Mark No.	Description	Part No.
86	Lever	ENC1244
87	Spring	EBH1481
88	Lever	ENC1245
89	•••••	
90	Pinch Roller Unit	EXA1350
91	•••••	
92	Arm	ENC1305
93	Spring	EBH1367
94	Cord	EDD1010
95	Bracket	ENC1339

6. ELECTRICAL PARTS LIST

NOTE:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

Circuit Symbol & No.	Part Name	Part No.
Unit Number : CWE1312		
Unit Name : FM/AM Tuner Unit		
MISCELLANEOUS		
IC 1		PA2021B
IC 2		PA2022A
Q 1		3SK195
Q 2 202		2SC2712
Q 3		DTC124EU
Q 51		DTC124TU
Q 52		2SC4207
Q 201		2SK435
D 1		1SV172
D 2 3 4		KV1410
D 5		MA151WK-MT
D 6 151 201 202		MA157-MR
D 203		SVC203CP
L 1	Ferri-Inductor	LCTBR12K2125
L 2 52	Ferri-Inductor	LAU150K
L 51	Ferri-Inductor	LAU2R2K
L 201	Ferri-Inductor	LAU4R7K
L 202	Coil 1mH	CTF1026
L 203	Inductor	LAU390K
L 204	Ferri-Inductor	LAU680K
L 205	Ferri-Inductor	LAU330K
L 206	Inductor	CTF1198
T 1	Coil	CTC1078
T 2	Coil	CTE1077
T 3	Coil	CTC1077
T 4	Coil	CTC1079
T 51	Coil	CTC1119
T 202	Coil	CTB1103
T 203	Coil	CTE1076
T 204	Coil	CTE1085
T 205	Coil	CTE1086
CF 1 51 52	Ceramic Filter	CTF1290
CF 201	Ceramic Filter	CTF1291
CF 202	Ceramic Filter	CTF1300
X 151	Ceramic Resonator	CSS1308
X 201	Crystal Resonator	CSS1111
VR 51 152	Semi-fixed 22kΩ(B)	CCP1208
VR 52	Semi-fixed 68kΩ(B)	CCP1211
VR 151	Semi-fixed 10kΩ(B)	CCP1206
AR 1	Capacitor with Discharge Gap	DSP-201M
RESISTORS		
R 1		RS1/16S223J
R 2		RS1/16S271J
R 3 10 16 18 20		RS1/16S223J
R 4		RS1/16S0R0J
R 6		RS1/16S680J
R 7 14		RS1/16S563J
R 8		RS1/16S152J
R 9		RS1/16S473J
R 11		RS1/16S474J
R 12		RS1/16S123J
R 13 15 217		RS1/16S563J
R 17 206		RS1/16S102J
R 21 22		RS1/16S560J
R 51 74		RS1/16S391J
R 52		RS1/16S182J
R 53		RS1/16S751J
R 54		RS1/16S393J
R 55 157		RS1/16S682J
R 56		RS1/16S332J
R 58 73 203		RS1/16S102J
R 72		RS1/16S391J
R 101		RS1/16S224J
R 102 222		RS1/16S822J
R 103		RS1/16S223J
R 104		RS1/16S822J
R 151 152		RS1/16S272J
R 153		RS1/16S103J
R 154 155 202		RS1/16S103J
R 156		RS1/16S153J
R 158		RS1/16S393J
R 159 216		RS1/16S103J
R 204 213		RS1/16S222J
R 205		RS1/16S823J
R 207		RS1/16S225J
R 208		RS1/16S752J
R 209		RS1/16S822J
R 214		RS1/16S333J
R 215		RS1/16S330J
R 218		RS1/16S333J
R 220		RS1/16S100J
R 221		RS1/16S473J
CAPACITORS		
C 1		CCSRCH220J50
C 2		CCSRTH390J50
C 3 102 154 163 203 210		CKSQYB473K16
C 4		CCSRTH070D50
C 5 53 54		CCSRCH270J50
C 6		CKSRYB222K50
C 7		CCSRCH040C50
C 8 105		CKSRYB222K50
C 9 16		CCSRCH470J50
C 10		CCSRSH090D50
C 11		CKSRYB223K25
C 12 13		CCSRCH070D50
C 14		CKSRYB103K50
C 15 22 55 101 151 164 219 220 225 227		CKSQYB104K25
C 17		CCSRRH100D50

=====Circuit Symbol & No. Part Name=====										Part No.
C	18									CCSRRH080D50
C	19	20	21	52	62	71	74	201	207	209 CKSRYB103K50
C	23									CEA3R3M50LL
C	24	29	73	106	213					CKSRYB223K25
C	25									CKSRYB682K50
C	26	28	231							CEA101M16LL
C	51	223								CKSRYB103K50
C	56	162	211							CEA010M50LL
C	57	64	66	237						CCSRCH101J50
C	58									CKSRYB153K25
C	60									CEAR47M50LL
C	61									CEAR22M50LL
C	63									CKSQYB104K25
C	65									CEA0R1M50LL
C	103									CKSQYB222K50
C	104									CEA4R7M35LL
C	152	153								CKSRYB333K16
C	155									CEAR47M50LL
C	156									CKSQYB333K25
C	158	212								CEA100M16LL
C	159									CKSRYB331K50
C	160									CKSYB105K16
C	161									CKSQYB104K25
C	202									CKSRYB332K50
C	204									CCSRCH120J50
C	205									CCSRCH560J50
C	206	221								CCSRCH680J50
C	208									CEA470M16LL
C	214	230								CKSRYB472K50
C	215	228								CKSRYB103K50
C	216									CCSRCH100D50
C	217									CCSRCH221J50
C	218	234								CEA220M16LL
C	222									CCSRCH150J50
C	224									CCSRUJ181J50
C	226									CEA4R7M35LL
C	229									CEAR68M50LL
C	232									CCSRCH390J50
C	233									CKSRYB332K50
C	235									CKSQYB104K25
C	236									CKSRYB223K25

Unit Number : CWM3803(KEH-3600/UC)
Unit Name : Tuner Amp Assy

MISCELLANEOUS

IC	251										LA3161P
IC	301										HA12134AF
IC	351										PA0059AM
IC	401										AN6263N
IC	451										SN761025DL
IC	551										PA3029A
IC	601										PD4502A
Q	301	302									DTC114TK
Q	401	605									DTC114ES
Q	501										2SC2458
Q	502										2SK330
Q	504										2SC2498
Q	505										2SC3295
Q	506	552	602	606							2SC2712
Q	551										DTC124EK
Q	601										DTC143TK
Q	603										2SC2712
Q	604	853									DTA114EK
Q	607										2SC2712
Q	851	852									DTC143TS

=====Circuit Symbol & No. Part Name=====										Part No.
Q	951									2SD1859
Q	952									2SB1243
Q	953	954	962	966						DTC114EK
Q	955									2SA1162
Q	956									2SA1048
Q	957									DTC143ES
Q	958	964								2SB1242
Q	959									2SD1684
Q	960	961								2SA1298
Q	963									DTC143TK
Q	965									2SD1859
D	251	502	503	601	603	605	606	608	609	610 1SS133
D	501									RD3R0ESB2
D	551	552								CWW1338
D	602									HZS9LA1
D	604									RD6R8JSB3
D	607									RD6R2JSB3
D	611	612	613	614						1SS133
D	615									HZS7LC3
D	951	952	953	955	956					ERA15-02VH
D	954									HZS6LB2
D	957									HZS9LB3
D	958									HZS9LC1
L	501				Ferri-Inductor					CTF-157
L	601	602			Ferri-Inductor					LAU2R2K
X	601				Crystal Resonator					CSS1011
VR	301	302			Semi-fixed 33kΩ(B)					VRMB6VS333
					FM/AM Tuner Unit					CWE1312

RESISTORS

R	251	252									RS1/10S273J
R	253	254									RS1/10S470J
R	255	256	459	503	607	636	637	952	956	958	RS1/10S472J
R	257	258	305	306	614	615	633				RS1/10S104J
R	263	264	265	311	471	547	641	645			RS1/10S0R0J
R	301	302	451	452							RS1/10S272J
R	303	304	512	563	564	565	566	639			RS1/10S332J
R	307	353	520	624	626	635					RS1/10S223J
R	308										RS1/10S183J
R	309										RS1/10S104J
R	312	313									RS1/8S0R0J
R	351										RS1/10S472J
R	352	461	622								RD1/4PS472JL
R	354	355	502								RD1/4PS103JL
R	356	462	531	533	534	535	536	537	546	548	RS1/8S0R0J
R	357	358									RS1/10S682J
R	359	360									RD1/4PS392JL
R	361	362	527	528							RS1/10S473J
R	363										RS1/8S0R0J
R	401	402									RS1/10S822J
R	403										RS1/10S100J
R	404										RS1/10S684J
R	453	454									RS1/10S151J
R	455	456									RS1/10S101J
R	457	458	516	521	526	567	571	623	625	634	RS1/10S103J
R	460										RS1/8S472J
R	465	466	505	506	965	966	974				RS1/10S102J
R	501										RD1/4PS223JL
R	504										RS1/10S152J
R	508	509	518	522	523	551	552	553	554	570	RS1/10S222J
R	510										RS1/8S822J
R	511										RS1/10S101J
R	513	852									RS1/10S821J
R	514										RS1/10S331J
R	515										RS1/10S680J

=====Circuit Symbol & No. Part Name=====	Part No.
R 517 620	RS1/10S123J
R 519 569	RS1/10S221J
R 525	RS1/8S103J
R 529	RS1/10S330J
R 530	RD1/4PS102JL
R 549 572 643 644	RS1/8S0R0J
R 555 556 559 560	RS1/10S2R2J
R 557 558 561 562	RD1/4PS2R2JL
R 568	RS1/10S153J
R 609	RS1/10S223J
R 610	RS1/10S474J
R 611	RS1/8S104J
R 612 617 619 957 959 961 972 973	RS1/10S473J
R 613	RS1/10S563J
R 616	RS1/10S332J
R 618	RD1/4PS222JL
R 621	RD1/4PS222JL
R 627 628 629 638	RS1/10S222J
R 630	RS1/10S683J
R 632	RS1/8S0R0J
R 646	RS1/10S472J
R 660	RD1/4PS103JL
R 721 722	RS1/10S0R0J
R 851	RS1/8S821J
R 853 854	RS1/10S103J
R 951	RS1/10S392J
R 953	RD1/4PS122JL
R 960 969 975	RS1/10S472J
R 962	RS1/10S2R2J
R 964	RD1/4PS471JL
R 967	RD1/4PS471JL
R 968	RD1/4PS102JL
R 970 971	RD1/4PS1R5JL
R 976	RS1/10S223J
CAPACITORS	
C 251 252 507	CKSQYB681K50
C 253 254 451 452 473 474 486	CEA2R2M50LL
C 255 256 353 362 403 961	CEA101M10LL
C 257 258 475 476	CKSQYB333K25
C 263 220μF/10V	CCH1014
C 301 302 304 351 352 364 368 463 464	CEA010M50LL
C 303 361	CEA470M10LL
C 305 306	CKSQYF224Z25
C 307 366 367 455 456 457 458 484 487 604	CKSQYF104Z25
C 308 355 356 401 504 506 511 958	CKSQYB103K50
C 309 310 357 358 359 360 363 453 454 603	CEA4R7M35LL
C 311 312 515 521 611	CKSQYB223K50
C 354 365 459 460 465 466 485 570 851 852	CEA100M16LL
C 369 370	CKSQYB222K50
C 402	CCSQSL330J50
C 404	CEA0R1M50LL
C 461 462	CKSQYB822K50
C 467 468	CKSQYB152K50
C 469 470	CKSQYB183K25
C 471 472 501 555 556 557 558 952	CKSQYB102K50
C 477 478 509 519	CCSQSL101J50
C 483	CEA470M10LL
C 502	CKSYB473K16
C 503 4.7μF/16V	CCH1005
C 508	CCSQCH101J50
C 510 513	CKSYB223K50
C 516 517 518 955	CKSQYB473K16
C 520	CKSQYB473K16
C 551 552 553 554	CEA4R7M16NPLL
C 559 560 607	CKSQYB104K25

=====Circuit Symbol & No. Part Name=====	Part No.
C 561 562 563 564 565 566 567 568	CFTLA104J50
C 569	CEAS330M10
C 601	CCSQCH100D50
C 602	CCSQCH080D50
C 606 956	CKSYF104Z25
C 609	CKSQYB122K50
C 610	CKSQYB221K50
C 951 960 470μF/16V	CCH1183
C 953 954	CEAS101M10
C 957 959	CEAS331M10
C 962	CEAS221M10
C 963 4700μF/16V	CCH1188
C 964	CKSQYB104K16
C 965	CEA220M16LL

Unit Number : CWM3807(KEH-490/UC)
Unit Name : Tuner Amp Assy

MISCELLANEOUS

IC 251	LA3161P
IC 401	AN6263N
IC 451	SN761025DL
IC 551	PA3029A
IC 601	PD4502A
Q 401 605	DTC114ES
Q 501	2SC2458
Q 502	2SK330
Q 504	2SC2498
Q 505	2SC3295
Q 506 552 602 606	2SC2712
Q 551	DTC124EK
Q 601	DTC143TK
Q 603	2SC2712
Q 604 853	DTA114EK
Q 607	2SC2712
Q 851 852	DTC143TS
Q 951	2SD1859
Q 952	2SB1243
Q 953 954 962 966	DTC114EK
Q 955	2SA1162
Q 956	2SA1048
Q 957	DTC143ES
Q 958 964	2SB1242
Q 959	2SD1684
Q 960 961	2SA1298
Q 963	DTC143TK
Q 965	2SD1859
D 251 502 503 601 603 605 606 608 609 610	1SS133
D 501	RD3R0ESB2
D 551 552	CWW1338
D 602	HZS9LA1
D 604	RD6R8JSB3
D 607	RD6R2JSB3
D 611 612 613 614	1SS133
D 615	HZS7LC3
D 951 952 953 955 956	ERA15-02VH
D 954	HZS6LB2
D 957	HZS9LB3
D 958	HZS9LC1
L 501 Ferri-Inductor	CTF-157
L 601 602 Ferri-Inductor	LAU2R2K
X 601 Crystal Resonator	CSS1011
FM/AM Tuner Unit	CWE1312

=====Circuit Symbol & No.	Part Name=====	Part No.
RESISTORS		
R 251 252		RS1/10S273J
R 253 254		RS1/10S470J
R 255 256 459 503 607 636 637 952 956 958		RS1/10S472J
R 257 258 614 615 633		RS1/10S104J
R 259 260		RS1/10S752J
R 261 262		RS1/10S183J
R 263 264 265 471 547 641 645		RS1/10S0R0J
R 312 313		RS1/8S0R0J
R 363		RS1/8S0R0J
R 401 402		RS1/10S822J
R 403		RS1/10S100J
R 404		RS1/10S684J
R 451 452		RS1/10S272J
R 453 454		RS1/10S151J
R 455 456		RS1/10S101J
R 457 458 516 521 526 567 571 623 625 634		RS1/10S103J
R 460		RS1/8S472J
R 461 622		RD1/4PS472JL
R 462 531 533 534 535 536 537 546 548		RS1/8S0R0J
R 465 466 505 506 965 966 974		RS1/10S102J
R 501		RD1/4PS223JL
R 502		RD1/4PS103JL
R 504		RS1/10S152J
R 508 509 518 522 523 551 552 553 554 570		RS1/10S222J
R 510		RS1/8S822J
R 511		RS1/10S101J
R 512 563 564 565 566 639		RS1/10S332J
R 513 852		RS1/10S821J
R 514		RS1/10S331J
R 515		RS1/10S680J
R 517 620		RS1/10S123J
R 519 569		RS1/10S221J
R 520 624 626 635		RS1/10S223J
R 525		RS1/8S103J
R 527 528		RS1/10S473J
R 529		RS1/10S330J
R 530		RD1/4PS102JL
R 549 572 643 644		RS1/8S0R0J
R 555 556 559 560		RS1/10S2R2J
R 557 558 561 562		RD1/4PS2R2JL
R 568		RS1/10S153J
R 603		RS1/10S472J
R 609		RS1/10S223J
R 610		RS1/10S474J
R 611		RS1/8S104J
R 612 617 619 957 959 961 972 973		RS1/10S473J
R 613		RS1/10S563J
R 616		RS1/10S332J
R 618		RD1/4PS222JL
R 621		RD1/4PS222JL
R 627 628 629 638		RS1/10S222J
R 630		RS1/10S683J
R 632		RS1/8S0R0J
R 646		RS1/10S472J
R 660		RD1/4PS103JL
R 721 722		RS1/10S0R0J
R 851		RS1/8S821J
R 853 854		RS1/10S103J
R 951		RS1/10S392J
R 953		RD1/4PS122JL
R 960 969 975		RS1/10S472J
R 962		RS1/10S2R2J
R 964		RD1/4PS471JL
R 967		RD1/4PS471JL
R 968		RD1/4PS102JL

=====Circuit Symbol & No.	Part Name=====	Part No.
R 970 971		RD1/4PS1R5JL
R 976		RS1/10S223J
CAPACITORS		
C 251 252 507		CKSQYB681K50
C 253 254 451 452 473 474 486		CEA2R2M50LL
C 255 256 403 961		CEA101M10LL
C 257 258 475 476		CKSQYB333K25
C 263	220μF/10V	CCH1014
C 401 504 506 511 958		CKSQYB103K50
C 402		CCSQSL330J50
C 404		CEA0R1M50LL
C 453 454 603		CEA4R7M35LL
C 455 456 457 458 484 487 604		CKSQYF104Z25
C 459 460 465 466 485 570 851 852		CEA100M16LL
C 461 462		CKSQYB822K50
C 463 464		CEA010M50LL
C 467 468		CKSQYB152K50
C 469 470		CKSQYB183K25
C 471 472 501 555 556 557 558 952		CKSQYB102K50
C 477 478 509 519		CCSQSL101J50
C 483		CEA470M10LL
C 502		CKSYB473K16
C 503	4.7μF/16V	CCH1005
C 508		CCSQCH101J50
C 510 513		CKSYB223K50
C 515 521 611		CKSQYB223K50
C 516 517 518 955		CKSQYB473K16
C 520		CKSQYB473K16
C 551 552 553 554		CEA4R7M16NPLL
C 559 560 607		CKSQYB104K25
C 561 562 563 564 565 566 567 568		CFTLA104J50
C 569		CEAS330M10
C 601		CCSQCH100D50
C 602		CCSQCH080D50
C 606 956		CKSYF104Z25
C 609		CKSQYB122K50
C 610		CKSQYB221K50
C 951 960	470μF/16V	CCH1183
C 953 954		CEAS101M10
C 957 959		CEAS331M10
C 962		CEAS221M10
C 963	4700μF/16V	CCH1188
C 964		CKSQYB104K16
C 965		CEA220M16LL

Unit Number : CWM3833
(KEH-3600/UC,3650/ES,490/UC,2600/UC,2650/ES)
Unit Name : Key Board Unit

MISCELLANEOUS		
IC 901		PDC015B
D 901 902		MA153-MC
D 903		MA110-1A
L 901	Inductor	LCTB150K2125
S 901 902 903 904 905 906 907 908 909 910		CSG1058
S 911 912 913 914 915 916		CSG1058
IL 901 902 903	Lamp 40mA 14V	CEL1296
LCD901	LCD	CAW1237
RESISTORS		
R 901		RS1/10S222J
R 902		RS1/8S222J
R 903 904 905 906 907 908 909 910		RS1/10S471J
R 911 912		RS1/8S471J
R 913		RS1/10S472J

=====Circuit Symbol & No. Part Name=====											Part No.
R	915	916	920	922	923	925	926	927	929	931	RS1/8S0R0J
R	917										RS1/10S472J
R	918										RS1/8S0R0J
R	919	921	924	928	930	943	947				RS1/10S0R0J
R	932	934	935	936	937	938	939	940	941	942	RS1/8S0R0J
R	944	945	948	949	950						RS1/8S0R0J
R	946										RS1/10S473J

CAPACITORS

C	901										CEA100M16LL
C	902	903									CKSQYB103K50
C	904										CKSQYB221K50
C	905										CKSQYB104K25

Unit Number : CWM3831(KEH-2403/UC)
Unit Name : Key Board Unit

MISCELLANEOUS

IC	901										PDC015B
D	901	902									MA153-MC
D	903										MA110-1A
L	901				Inductor						LCTB150K2125
S	901	902	903	904	905	906	907	908	909	910	CSG1058
S	911	912	913	914	915	916					CSG1058
IL	901	902	903		Lamp 65mA 14V						CEL1382
LCD	901				LCD						CAW1237

RESISTORS

R	901										RS1/10S222J
R	902										RS1/8S222J
R	903	904	905	906	907	908	909	910			RS1/10S471J
R	911	912									RS1/8S471J
R	913										RS1/10S472J
R	915	916	920	922	923	925	926	927	929	931	RS1/8S0R0J
R	917										RS1/10S472J
R	918										RS1/8S0R0J
R	919	921	924	928	930	943	947				RS1/10S0R0J
R	932	934	935	936	937	938	939	940	941	942	RS1/8S0R0J
R	944	945	948	949	950						RS1/8S0R0J
R	946										RS1/10S473J

CAPACITORS

C	901										CEA100M16LL
C	902	903									CKSQYB103K50
C	904										CKSQYB221K50
C	905										CKSQYB104K25

Unit Number :
Unit Name : P.C.Board(A)(KEH-3600/UC,KEH-3650/ES,KEH-490/UC)

S	2	Switch(FWD/REV)	ESH1003
D	1		F1SR35-100A

Unit Number :
Unit Name : P.C.Board(A)(KEH-2600/UC,KEH-2650/ES,KEH-2403/UC)

S	2	Switch(FWD/REV)	ESH1003

Unit Number :
Unit Name : P.C.Board(B)

S	3	Switch(TAPE/TUN)	CSN1005
S	4	Switch(MUTE B)	ESH1004

=====Circuit Symbol & No. Part Name=====			Part No.

Miscellaneous Parts List(KEH-3600/UC,KEH-3650/ES,KEH-490/UC)

S	1	Switch(MUTE A)	ESN1014
M	1	Motor Unit	EXA1304
HD	1	Head Assy	EXA1163
SO	1	Solenoid	EXP1010

Miscellaneous Parts List(KEH-2600/UC,KEH-2650/ES,KEH-2403/UC)

S	1	Switch(MUTE A)	ESN1014
M	1	Motor Unit	EXA1304
HD	1	Head Assy	EXA1163

• The KEH-3650/ES Parts Lists enumerate the parts which differ from those enumerated in the KEH-3600/UC Parts List only.
The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly.
The KEH-3600/UC Parts List is given on page 1-21.

Unit Number : CWM3803(KEH-3600/UC)
: CWM3804(KEH-3650/ES)
Unit Name : Tuner Amp Assy

	KEH-3600/UC	KEH-3650/ES
Circuit Symbol & No.	Part No.	Part No.
R601	•••••	RS1/10S472J
R607	RS1/10S472J	•••••

• The KEH-2600/UC , KEH-2650/ES and KEH-2403/UC Parts Lists enumerate the parts which differ from those enumerated in the KEH-490/UC Parts List only.
The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly.
The KEH-490/UC Parts List is given on page 1-21.

Unit Number : CWM3807(KEH-490/UC)
: CWM3808(KEH-2600/UC,KEH-2403/UC)
: CWM3809(KEH-2650/ES)
Unit Name : Tuner Amp Assy

	KEH-490/UC	KEH-2600/UC KEH-2403/UC	KEH-2650/ES
Circuit Symbol & No.	Part No.	Part No.	Part No.
IC401	AN6263N	•••••	•••••
Q401	DTC114ES	•••••	•••••
R401,402	RS1/10S822J	•••••	•••••
R403	RS1/10S100J	•••••	•••••
R404	RS1/10S684J	•••••	•••••
R603	RS1/10S472J	•••••	RS1/10S472J
R605	•••••	RS1/10S472J	•••••
R607	RS1/10S472J	•••••	•••••
C401	CKSQYB103K50	•••••	•••••
C402	CCSQSL330J50	•••••	•••••
C403	CEA101M10LL	•••••	•••••
C404	CEA0R1M50LL	•••••	•••••

7. CIRCUIT DESCRIPTION

● FLEX function(IC351) (KEH-3600/UC,KEH-3650/ES)

● Functions

To correct high-frequency signals to those of 1/f spectrum.
To serve as the signal level meter detecting circuit.

● Circuit Operation

The following is the flowchart of the operations.

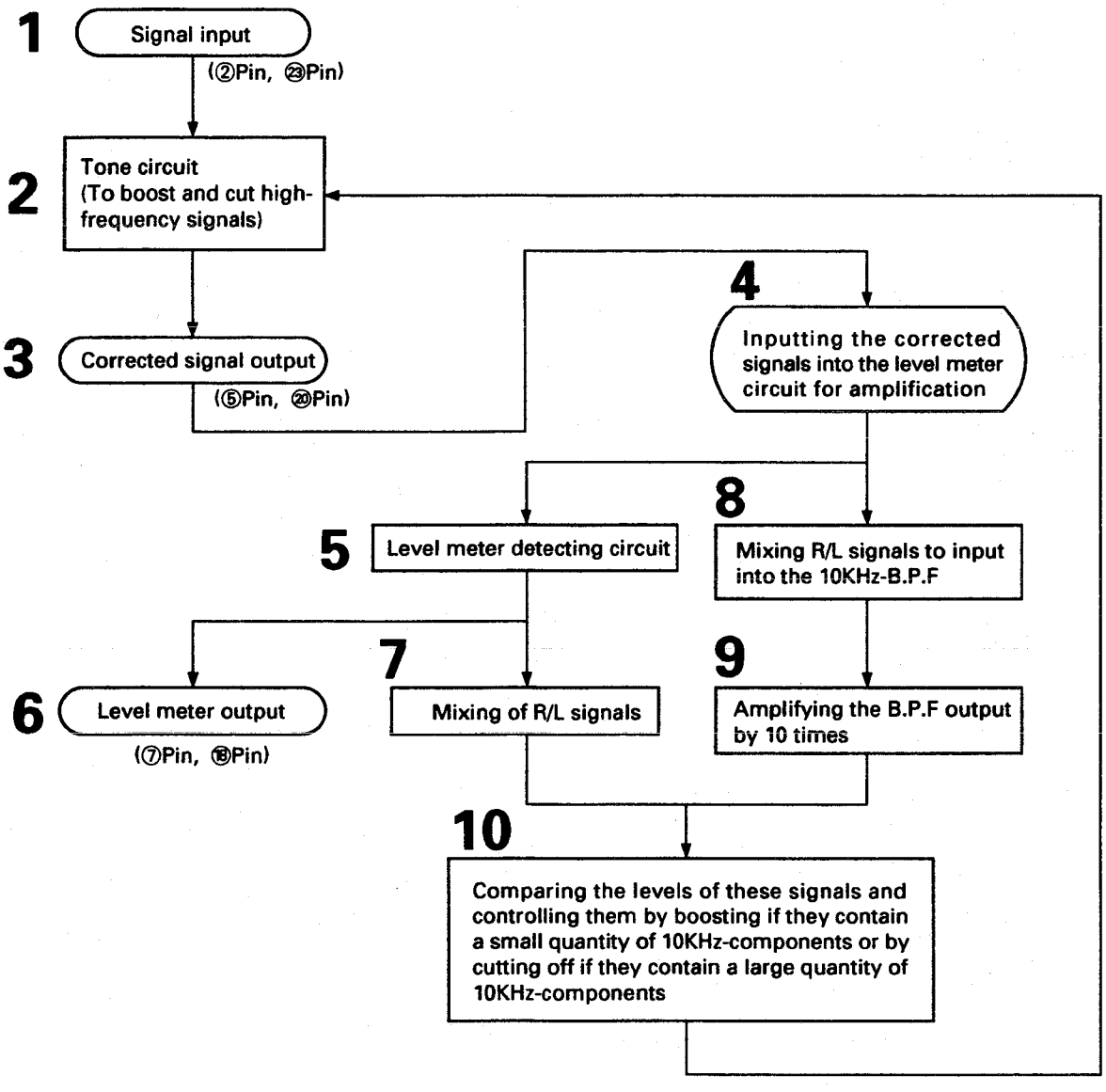
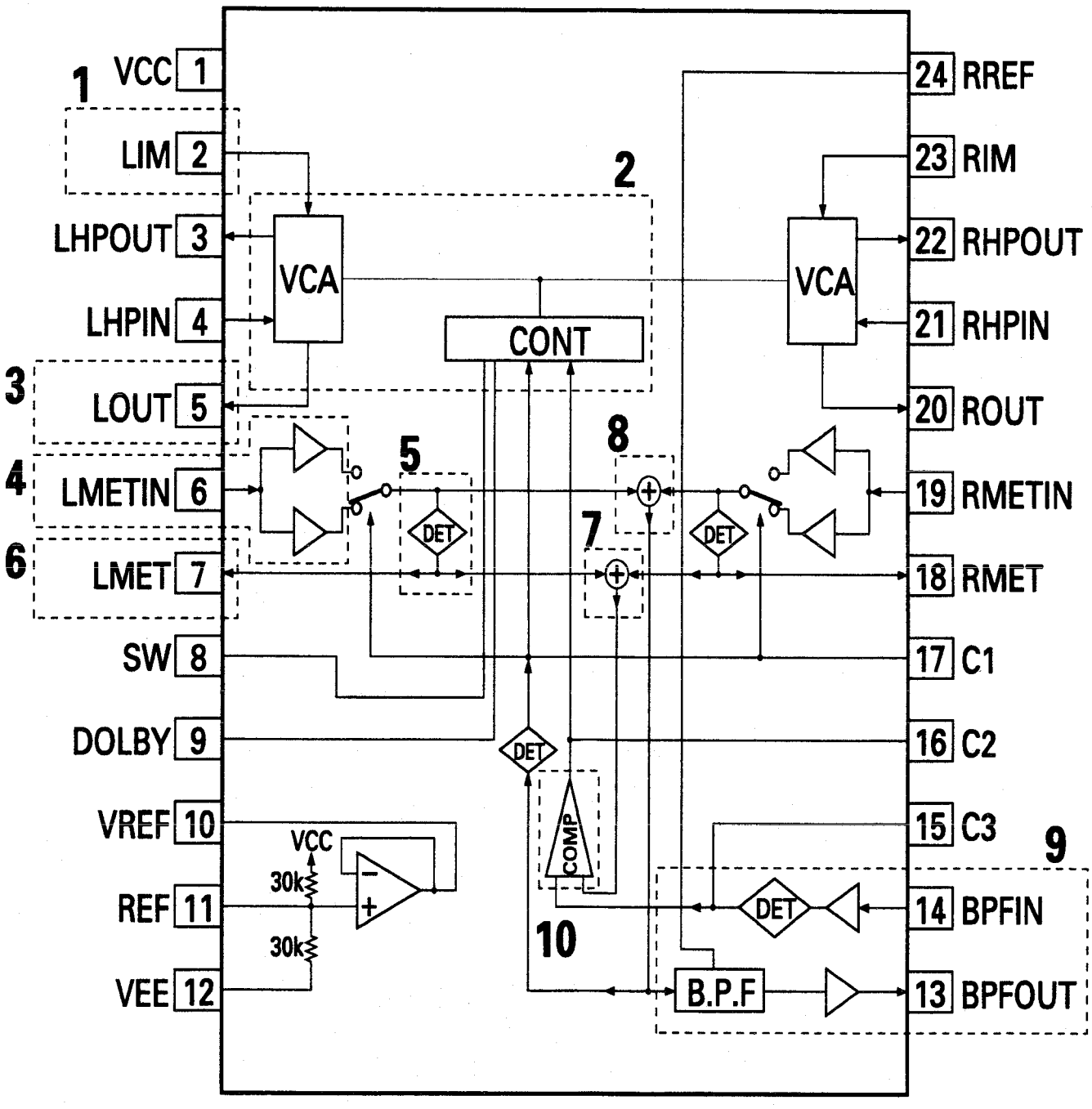

1
Signal input
(②Pin, ㉓Pin)
2
Tone circuit
(To boost and cut high-frequency signals)
3
Corrected signal output
(⑤Pin, ⑳Pin)
4
Inputting the corrected signals into the level meter circuit for amplification
5
Level meter detecting circuit
6
Level meter output
(⑦Pin, ⑱Pin)
7
Mixing of R/L signals
8
Mixing R/L signals to input into the 10KHz-B.P.F
9
Amplifying the B.P.F output by 10 times
10
Comparing the levels of these signals and controlling them by boosting if they contain a small quantity of 10KHz-components or by cutting off if they contain a large quantity of 10KHz-components

Fig.12

FLEX IC PA0059AM carries out the operations shown in the above flowchart in real time to always correct signals to those of 1/f spectrum.
However, the outer circuit will respond to cuts in the high range of 10KHz components.

● **Block Diagram**



* The figures correspond to those in the flowchart.

Fig.13

PIONEER
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Service Manual

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CASSETTE CAR STEREO WITH FM/AM ELECTRONIC TUNER

KEH-3600 UC
KEH-3650 ES
KEH-490 UC
KEH-2600 UC
KEH-2650 ES
KEH-2403 UC

CHAPTER 2

CONTENTS

CHAPTER 2

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Service Manual

ORDER NO.
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CASSETTE CAR STEREO WITH FM/AM ELECTRONIC TUNER

KEH-3600 X1MA/UC, X1M/UC
KEH-3650 X1MA/ES, X1N/ES
KEH-490 X1MA/UC
KEH-2600 X1MA/UC, X1M/UC
KEH-2650 X1MA/ES, X1IN/ES, X1N/ES
KEH-2403 X1MA/UC, X1M/UC

- As to KEH-3600/X1MA/UC and KEH-3600/X1M/UC , refer to CRT1600 (KEH-3600/UC) because of the same contents.
- As to KEH-3650/X1MA/ES and KEH-3650/X1N/ES , refer to CRT1600 (KEH-3650/ES) because of the same contents.
- As to KEH-490/X1MA/UC , refer to CRT1600 (KEH-490/UC) because of the same contents.
- As to KEH-2600/X1MA/UC and KEH-2600/X1M/UC , refer to CRT1600 (KEH-2600/UC) because of the same contents.
- As to KEH-2650/X1MA/ES , KEH-2650/X1IN/ES and KEH-2650/X1N/ES , refer to CRT1600 (KEH-2650/ES) because of the same contents.
- As to KEH-2403/X1MA/UC and KEH-2403/X1M/UC , refer to CRT1600 (KEH-2403/UC) because of the same contents.

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1. PACKING METHOD

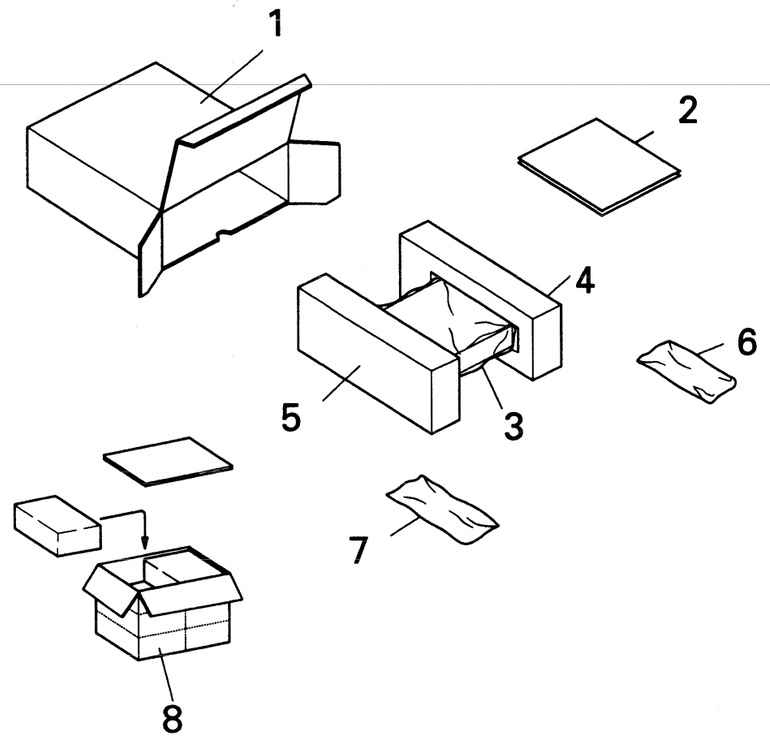


Fig.1

● Parts List(KEH-3600/UC)

✱ : Non Spare Part

Mark	No.	Description	Part No.
	1	Carton	CHG2476
	2-1	Owner's Manual	CRD1750
✱	2-2	Card	ARY1048
	3	Cover	CEG1092
	4	Protector	CHP1606
	5	Protector	CHP1607
	6	Cord Assy	CDE4326
	7	Accessory Assy	CEA1918
	8	Contain Box	CHL2476

• The KEH-3650/ES,490/UC,2600/UC,2650/ES and KEH-2403/UC Parts Lists enumerate the parts which differ from those enumerated in the KEH-3600/UC Parts List only. The parts other than those enumerated in the former are identical with those in the latter, to which you are requested to refer, accordingly. The KEH-3600/UC Parts List is given on page 2-3.

Mark	No.	Description	KEH-3600 /UC Part No.	KEH-3650 /ES Part No.	KEH-490 /UC Part No.	KEH-2600 /UC Part No.	KEH-2650 /ES Part No.	KEH-2403 /UC Part No.
	1	Carton	CHG2476	CHG2477	CHG2481	CHG2482	CHG2484	CHG2483
	2-1	Owner's Manual	CRD1750	CRD1748	CRD1752	CRD1750	CRD1748	CRD1758
✱	2-2	Card	ARY1048	•••••	CRY1070	ARY1048	•••••	ARY1048
	7	Accessory Assy	CEA1918	CEA2002	CEA1918	CEA1918	CEA2002	CEA1918
	8	Contain Box	CHL2476	CHL2477	CHL2481	CHL2482	CHL2484	CHL2483

● Owner's Manual

Part No.	Model	Language
CRD1750	KEH-3600/UC,2600/UC	English,French,Spanish
CRD1752	KEH-490/UC	English,French,Spanish
CRD1758	KEH-2403/UC	English,French,Spanish
CRD1748	KEH-3650/ES,2650/ES	English,French,Spanish,Arabic

● Accessory Assy

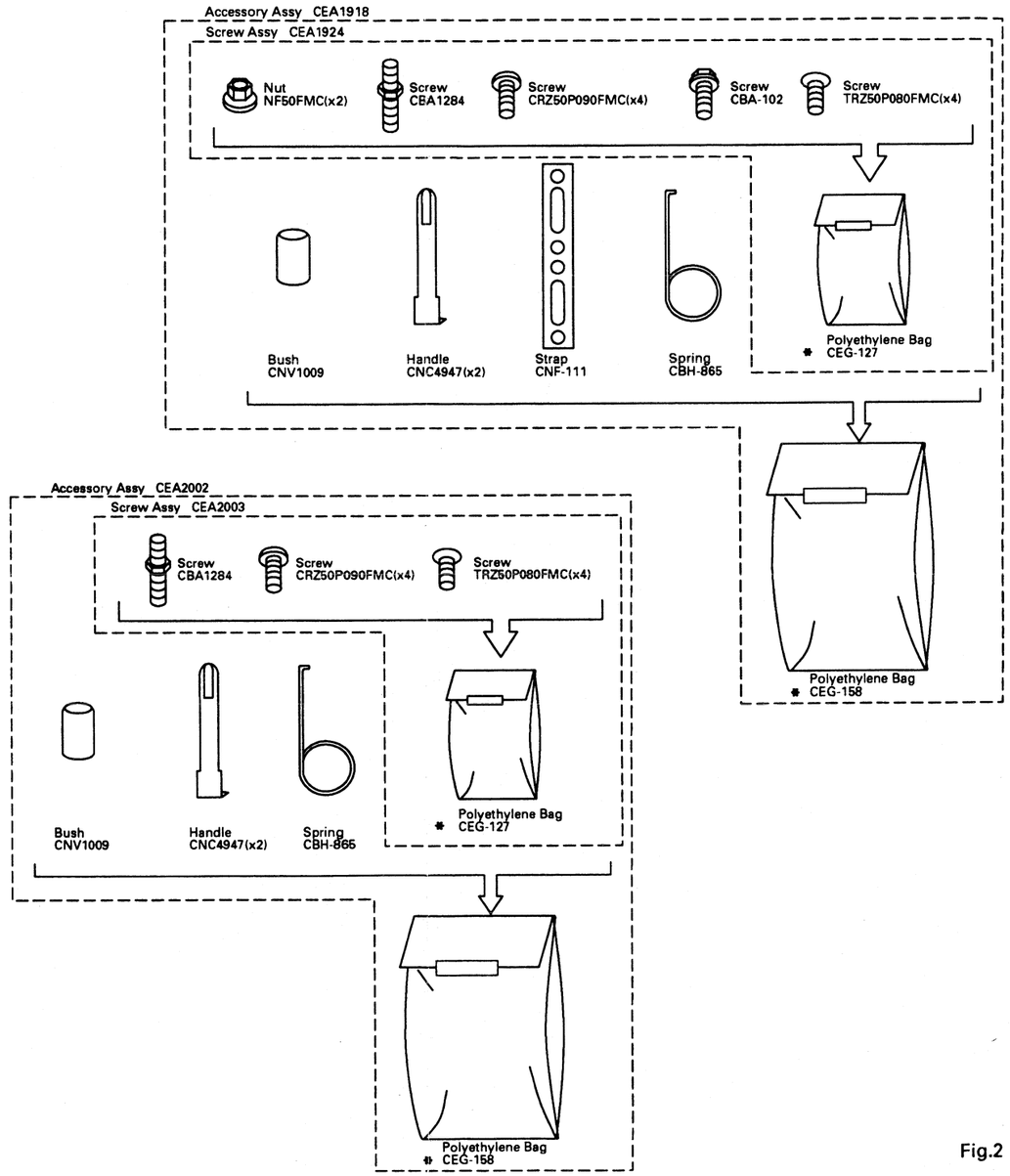


Fig.2

2. CONNECTION DIAGRAM(KEH-3600/UC,3650/ES)

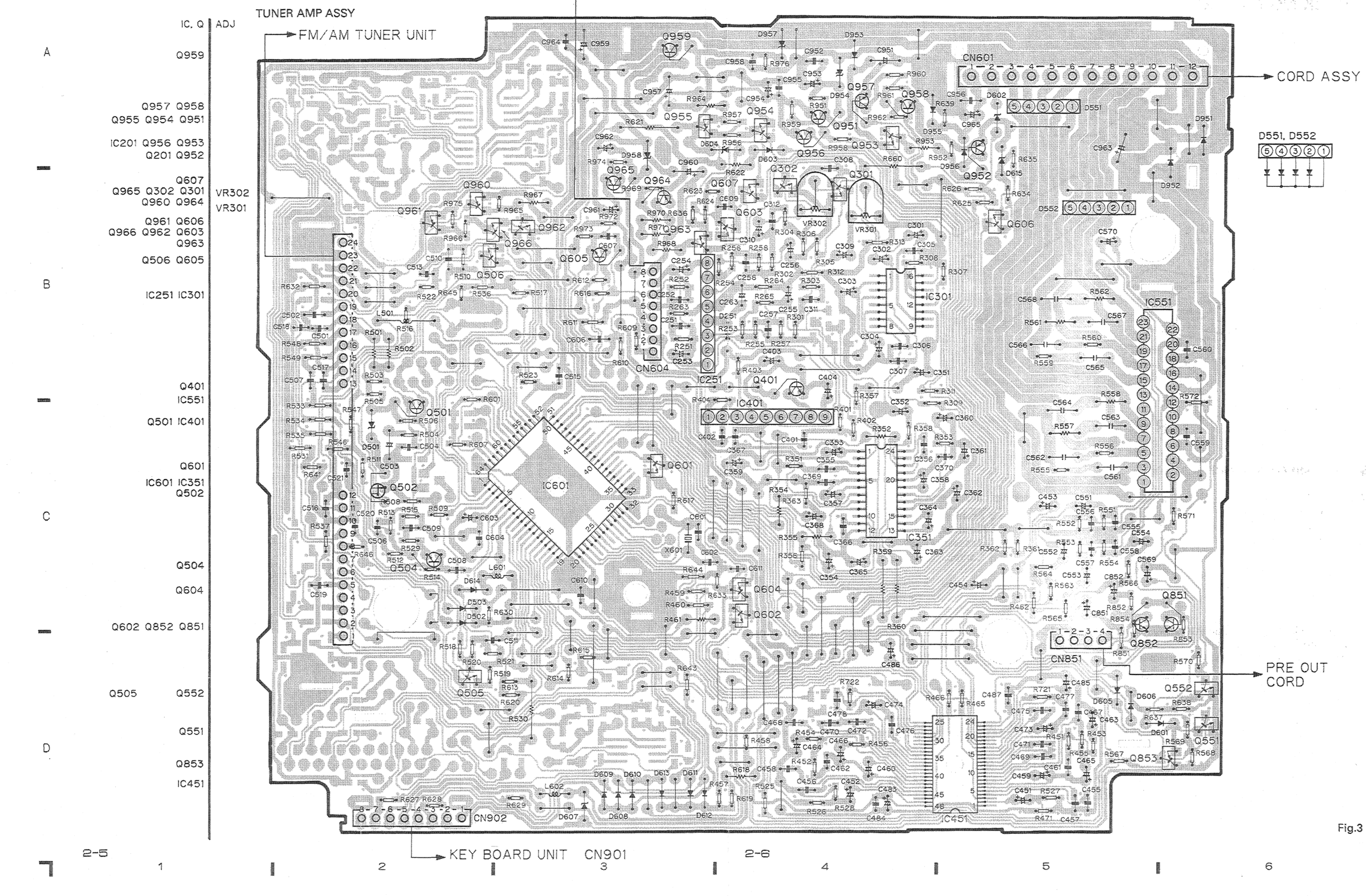
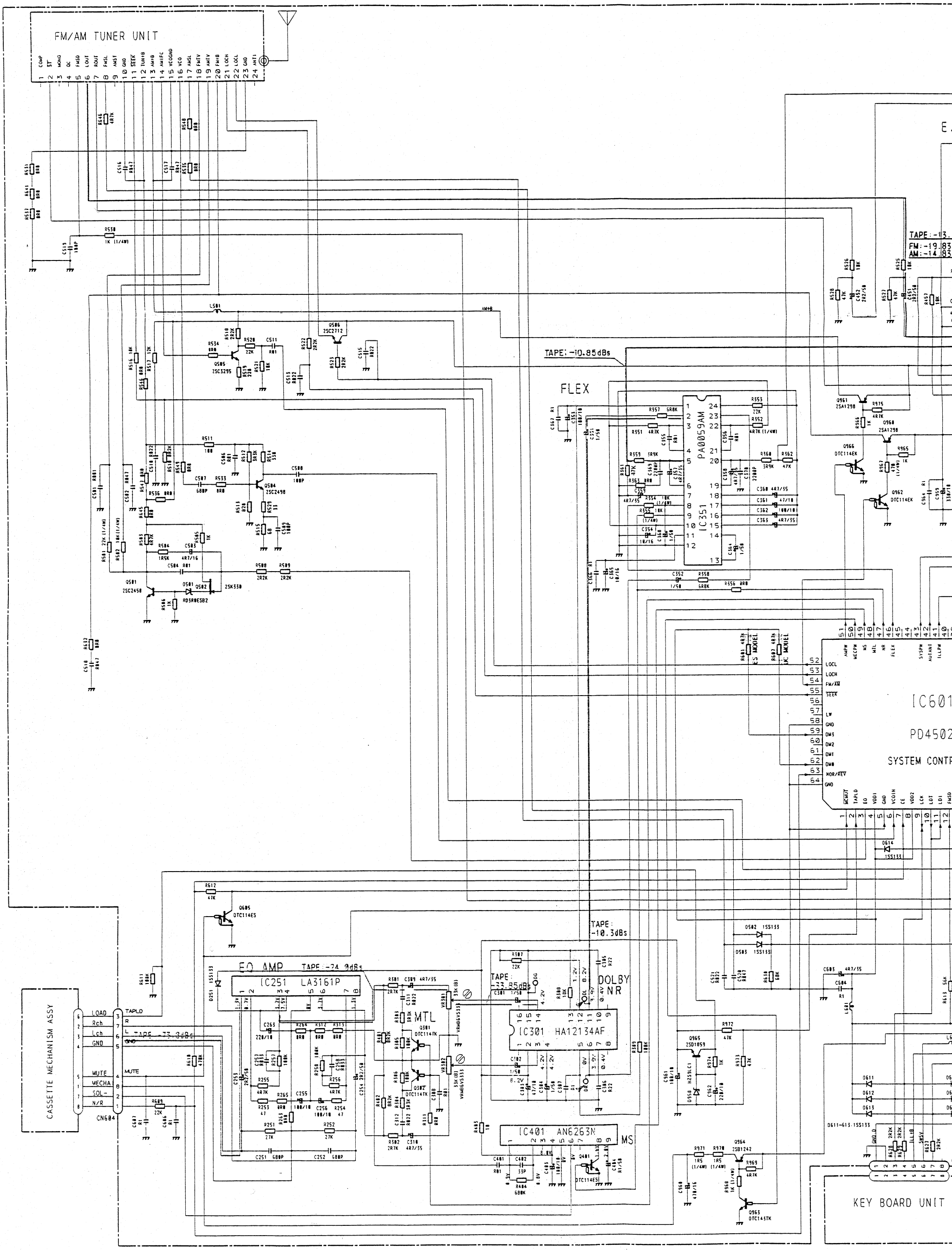


Fig.3

3. SCHEMATIC CIRCUIT DIAGRAM(KEH-3600/UC,3650/ES)



NOTE

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

TUNER AMP ASSY

E.VOL

IC451 SN761025DL

TAPE:-13.7dBs
FM:-19.837dBs
AM:-14.837dBs

TAPE:-2.8dBs
FM:5.063dBs
AM:10.063dBs

PRE.OUT

CN851

TAPE:-3.7dBs
FM:4.163dBs
AM:9.163dBs

Lch OUT

Rch OUT

Q851 DTC144TS

Q852 DTC144TS

Q853 DTA114EK

PW.AMP

IC551 PA3029A

TAPE:28.3dBs
FM:28.163dBs
AM:33.163dBs

FL+
FL-
FR+
FR-
RL+
RL-
RR+
RR-

CN601

IC601

PD4502A

SYSTEM CONTROLLER

X601 4.5MHz

14.4V BU

FUSE 6A

BACK UP

GND

ACC

1K(1/2W)

FUSE 0.5A

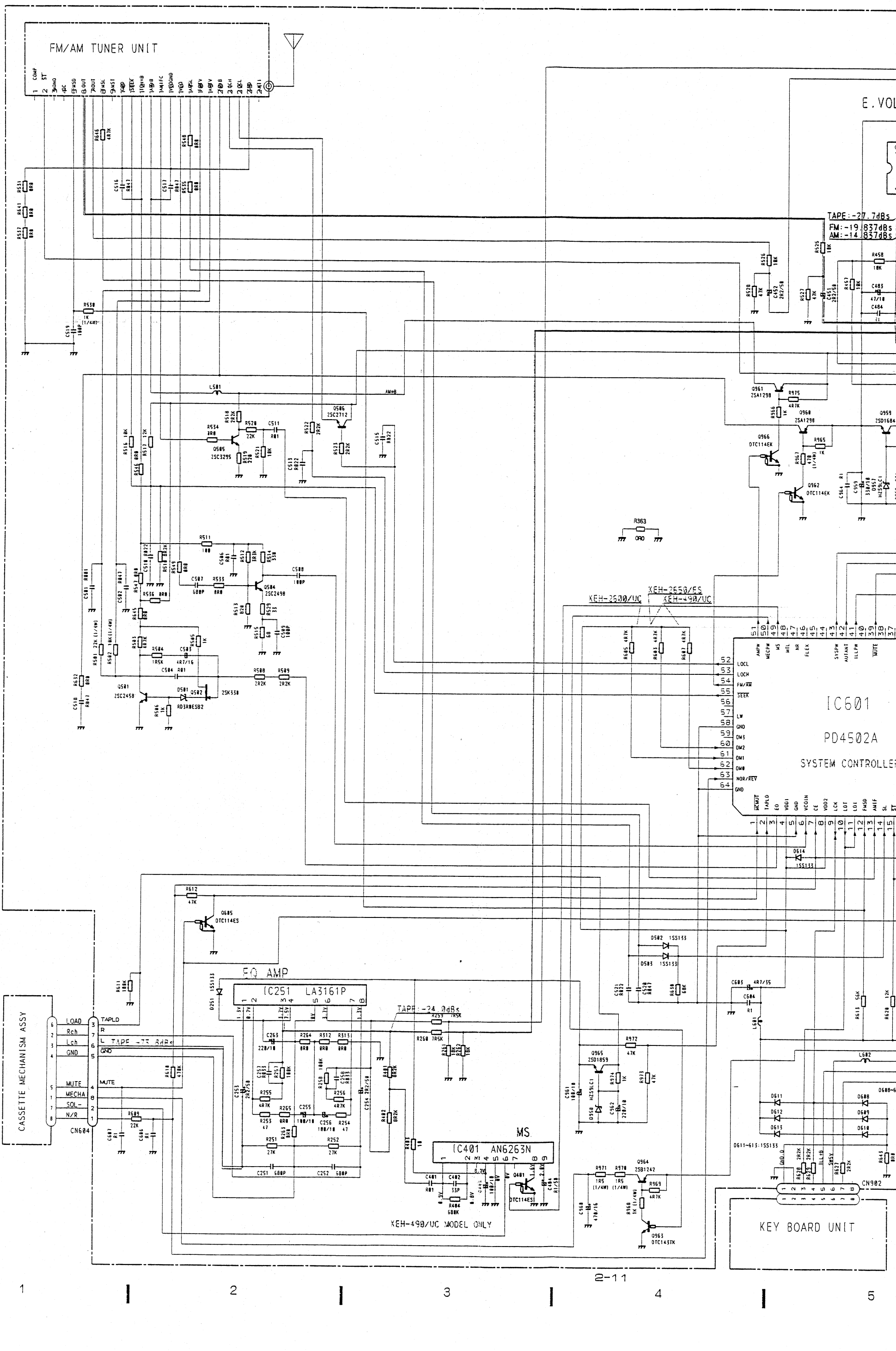
B REMOTE

CN902

BOARD UNIT

Fig.4

4. SCHEMATIC CIRCUIT DIAGRAM(KEH-490/UC,2600/UC,2650/ES,2403/UC)



NOTE:

Symbol indicates a resistor.
No differentiation is made between chip resistors and discrete resistors.

Symbol indicates a capacitor.
No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

TUNER AMP ASSY

E.VOL

IC451 SN761025DL

TAPE:-27.7dBs
FM:-19.837dBs
AM:-14.837dBs

TAPE:-2.8dBs
FM:5.065dBs
AM:10.063dBs

PRE.OUT

TAPE:-3.7dBs
FM:4.165dBs
AM:9.163dBs

Lch OUT

Rch OUT

Q851 DTC143TS
Q852 DTC143TS
Q853 DTA114EK

CN851

Q959 2SD1684
Q955 2SA1162
Q954 DTC114EK

PW.AMP

IC551 PA3029A

Q551 CWW1338
Q552 CWW1338

TAPE 20.3dBs
FM:28.165dBs
AM:33.163dBs

CN601

FL+
FL-
FR+
FR-
RL+
RL-
RR+
RR-

Q681 DTC143TK
Q551 DTC124EK
Q552 2SC2712

IC601 PD4502A
EM CONTROLLER

X601 4.5MHz

14.4V BU

BACK UP
FUSE 6A
GND
ACC
1K(1/2W)
REMOTE
FUSE 0.5A

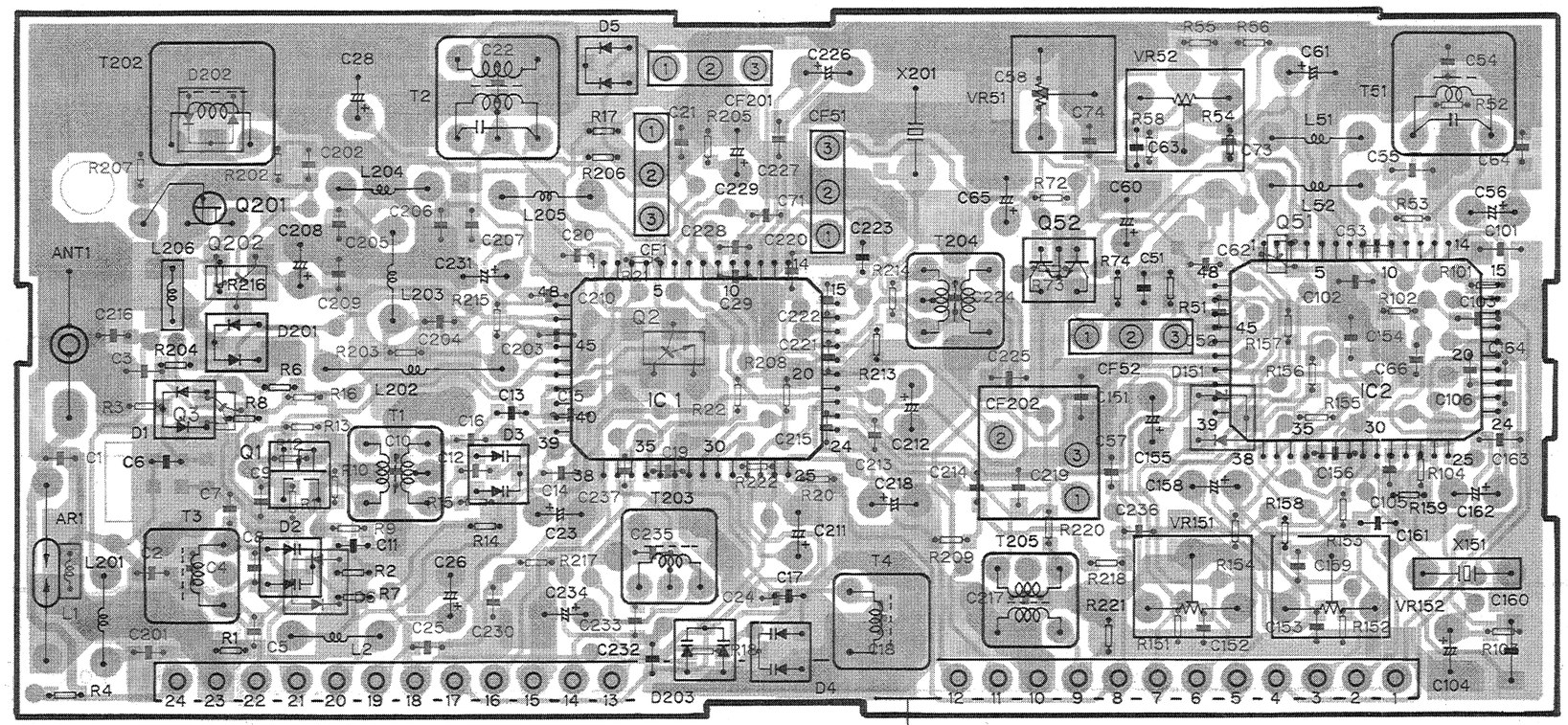
Q951 2SD1859
Q952 2SB1243
Q953 DTC114EK
Q956 2SA1048
Q957 DTC143ES
Q958 2SB1242
Q603 2SC2712
Q604 DTA114EK
Q607 2SC2712
Q682 2SC2712
Q686 2SC2712

CN902

UNIT

Fig.5

● Connection Diagram



TUNER AMP ASSY

Fig.8

6.2 KEY BOARD UNIT

● **Circuit Diagram**

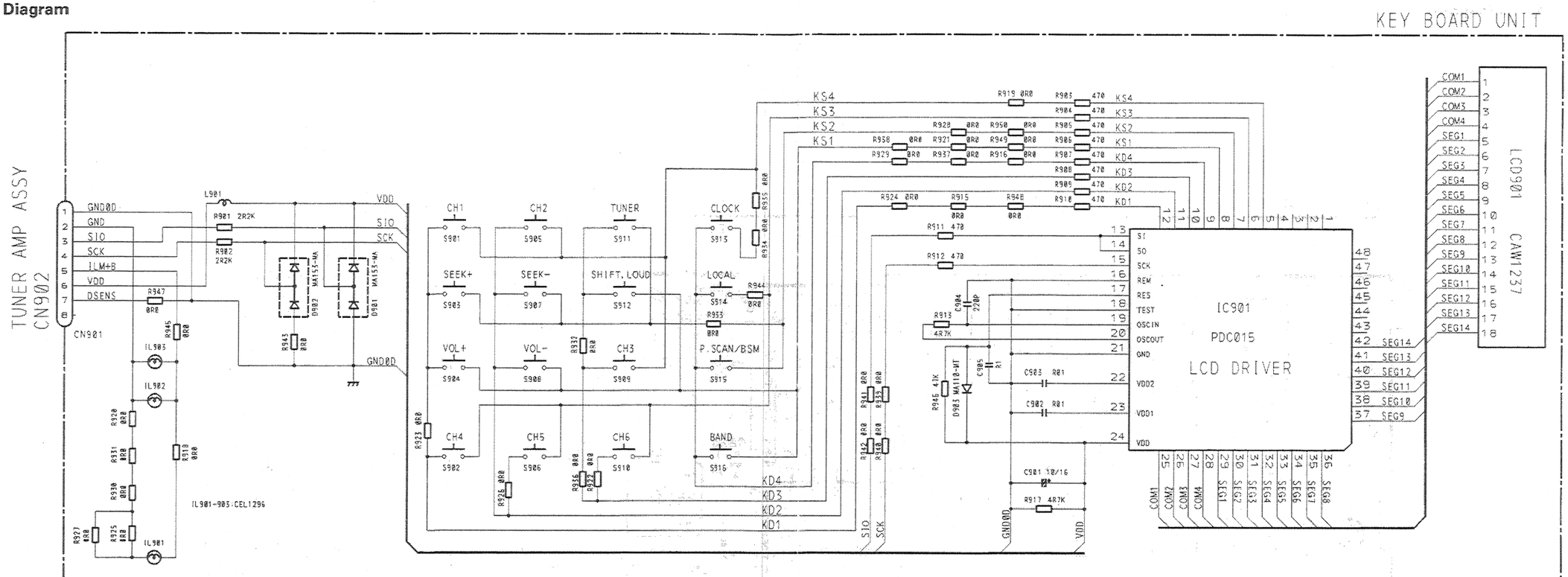


Fig.9

● **Connection Diagram**

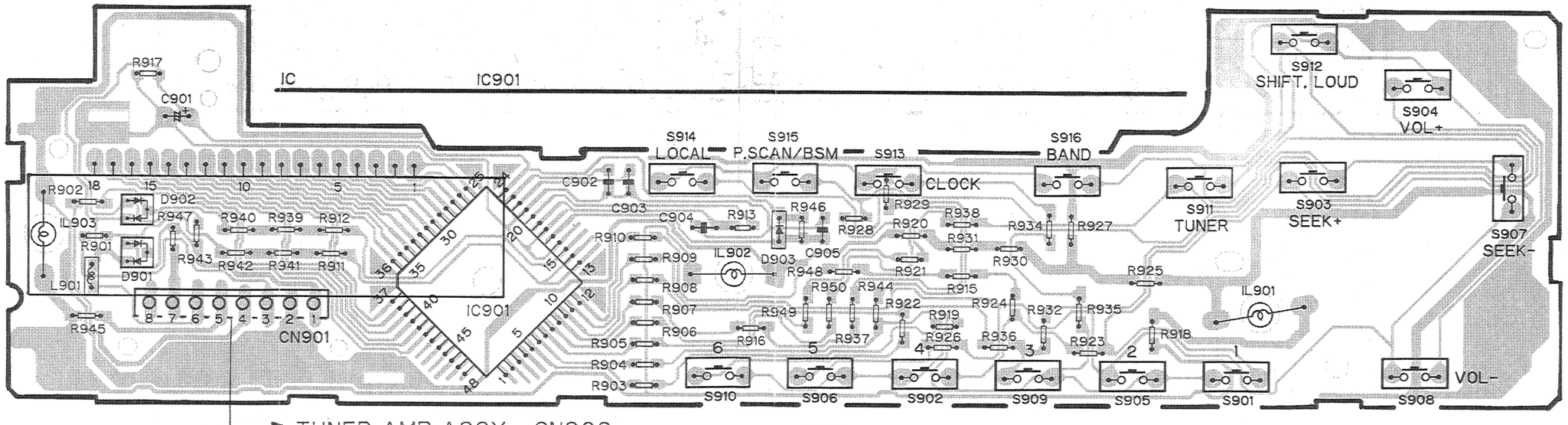


Fig.10

5. CONNECTION DIAGRAM(KEH-490/UC,2600/UC,2650/ES,2403/UC)

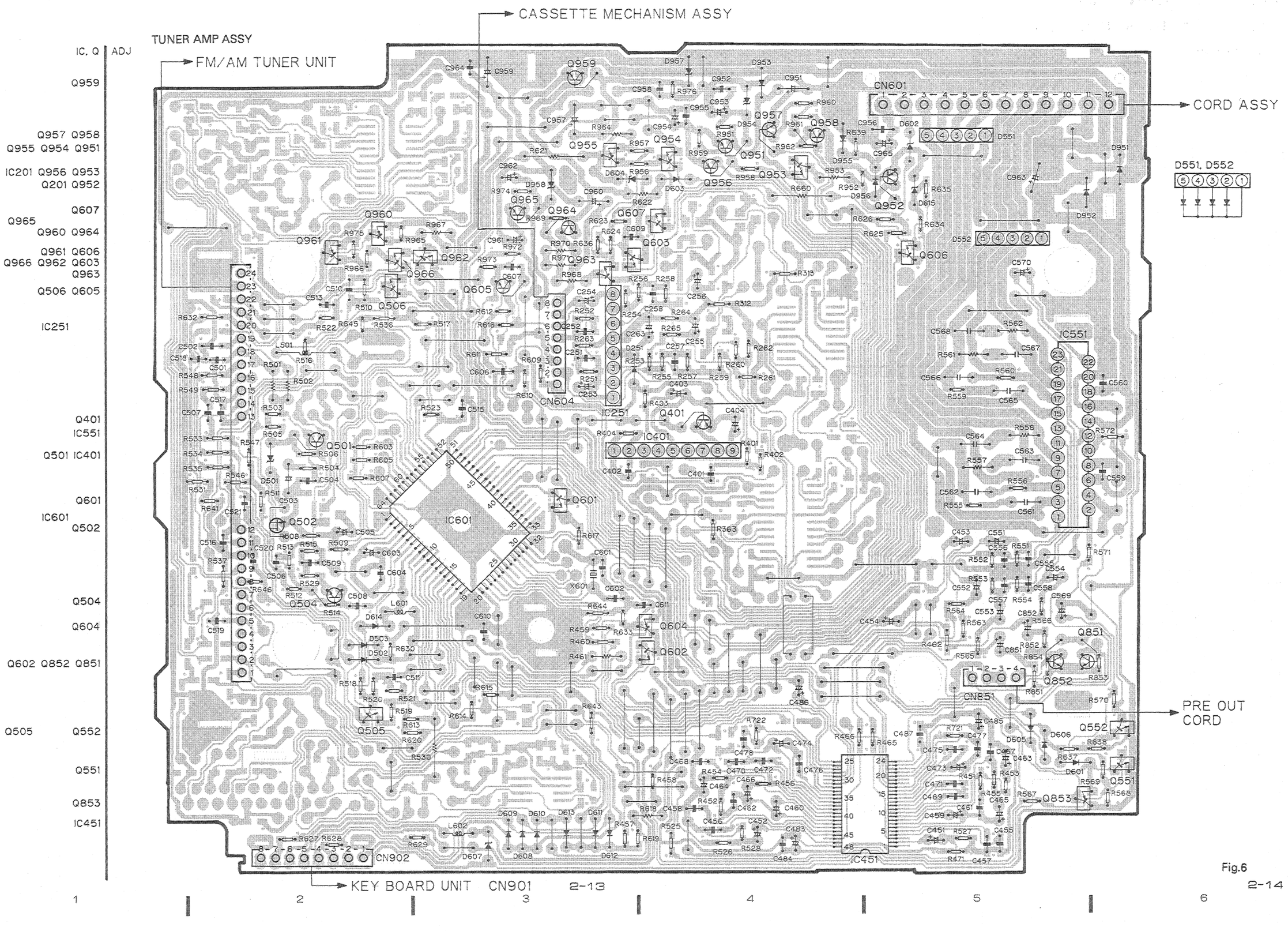


Fig.6

6. CIRCUIT DIAGRAM AND PATTERN

6.1 FM/AM TUNER UNIT(CWE1312)

● Circuit Diagram

NOTE:
- Symbol indicates a resistor. No differentiation is made between chip resistors and discrete resistors.
- Symbol indicates a capacitor. No differentiation is made between chip capacitors and discrete capacitors.

Decimal points for resistor and capacitor fixed values are expressed as:
2.2→2R2
0.022→R022

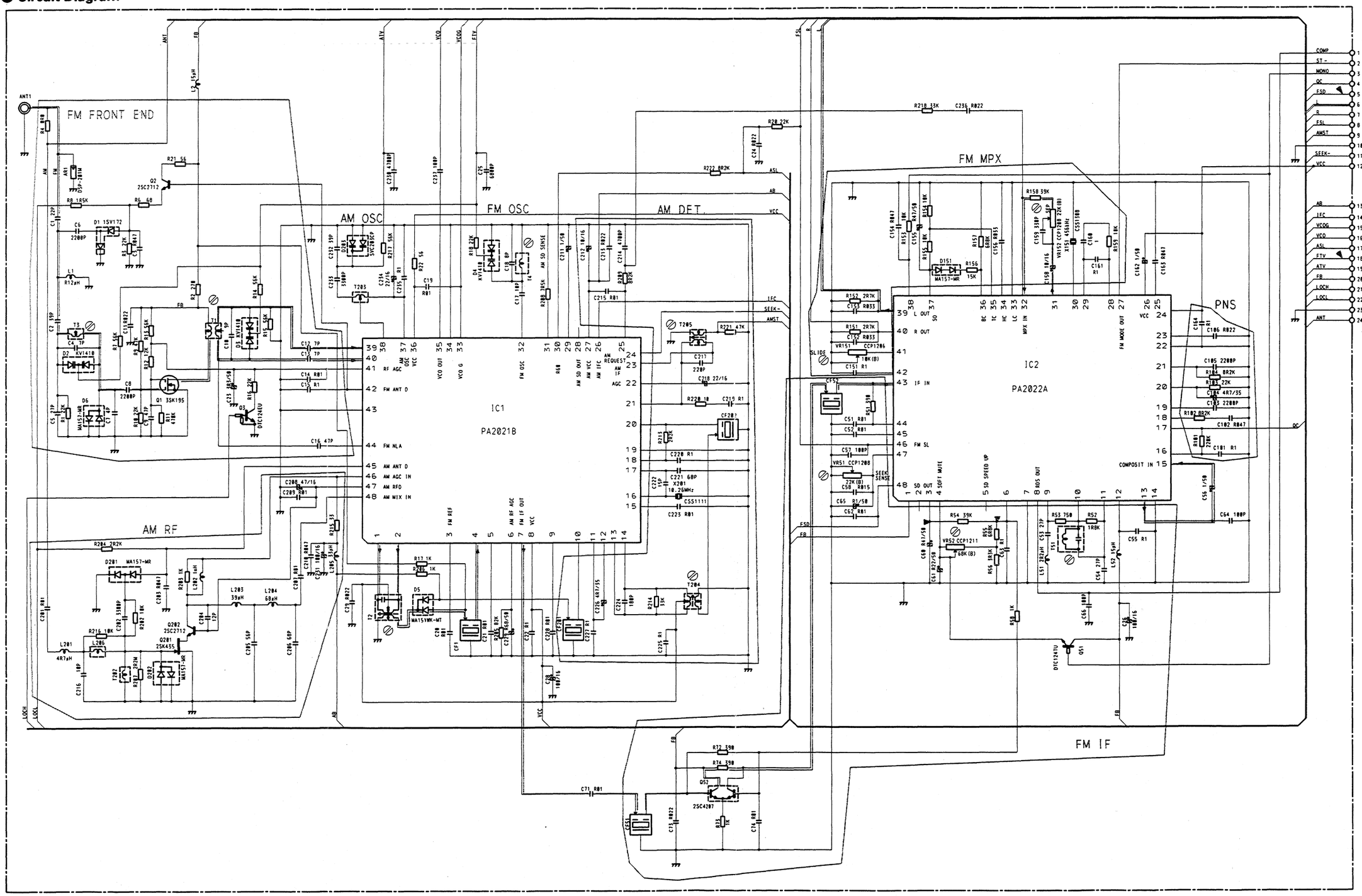
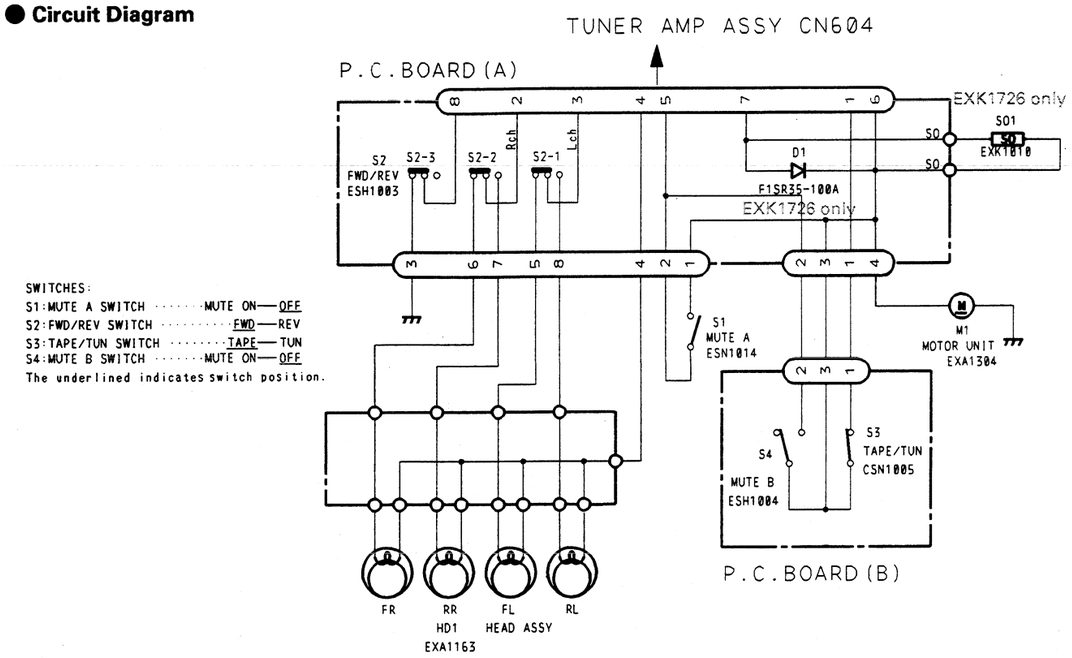


Fig.7

6.3 CASSETTE MECHANISM ASSY

● **Circuit Diagram**



SWITCHES:
S1:MUTE A SWITCH ·····MUTE ON—OFF
S2:FWD/REV SWITCH ·····FWD—REV
S3:TAPE/TUN SWITCH ·····TAPE—TUN
S4:MUTE B SWITCH ·····MUTE ON—OFF
The underlined indicates switch position.

● **Connection Diagram**

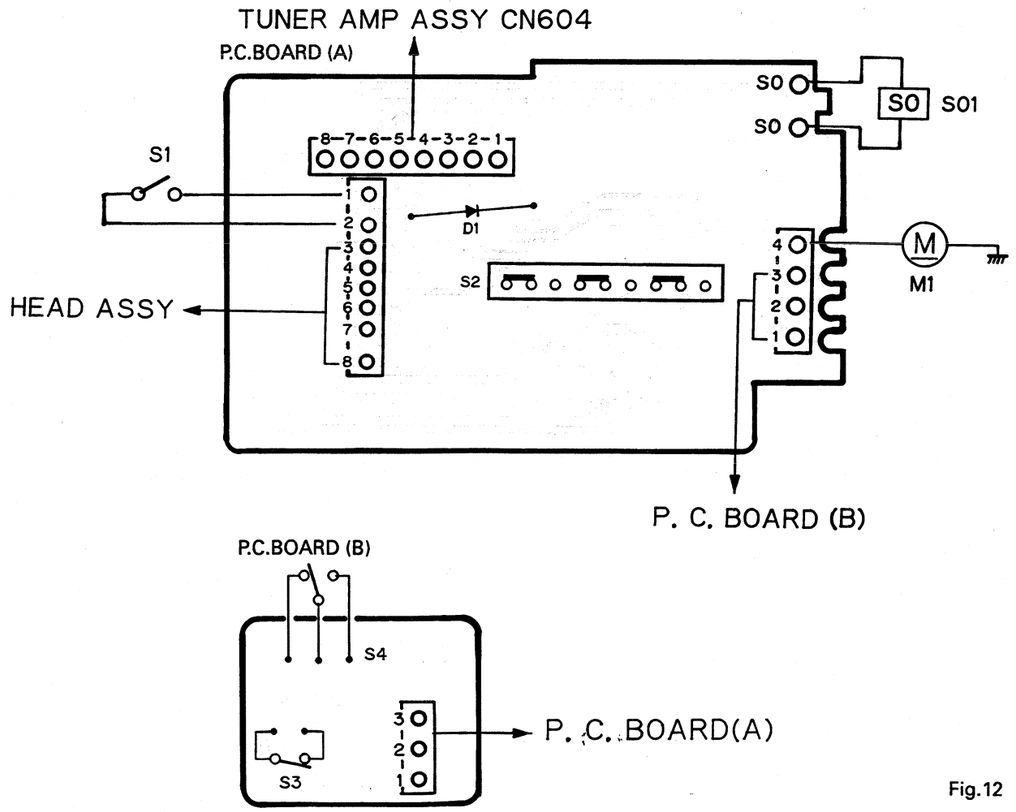


Fig.12

7. EXPLODED VIEW

● **Chassis(Parts List:Page 1-16)**

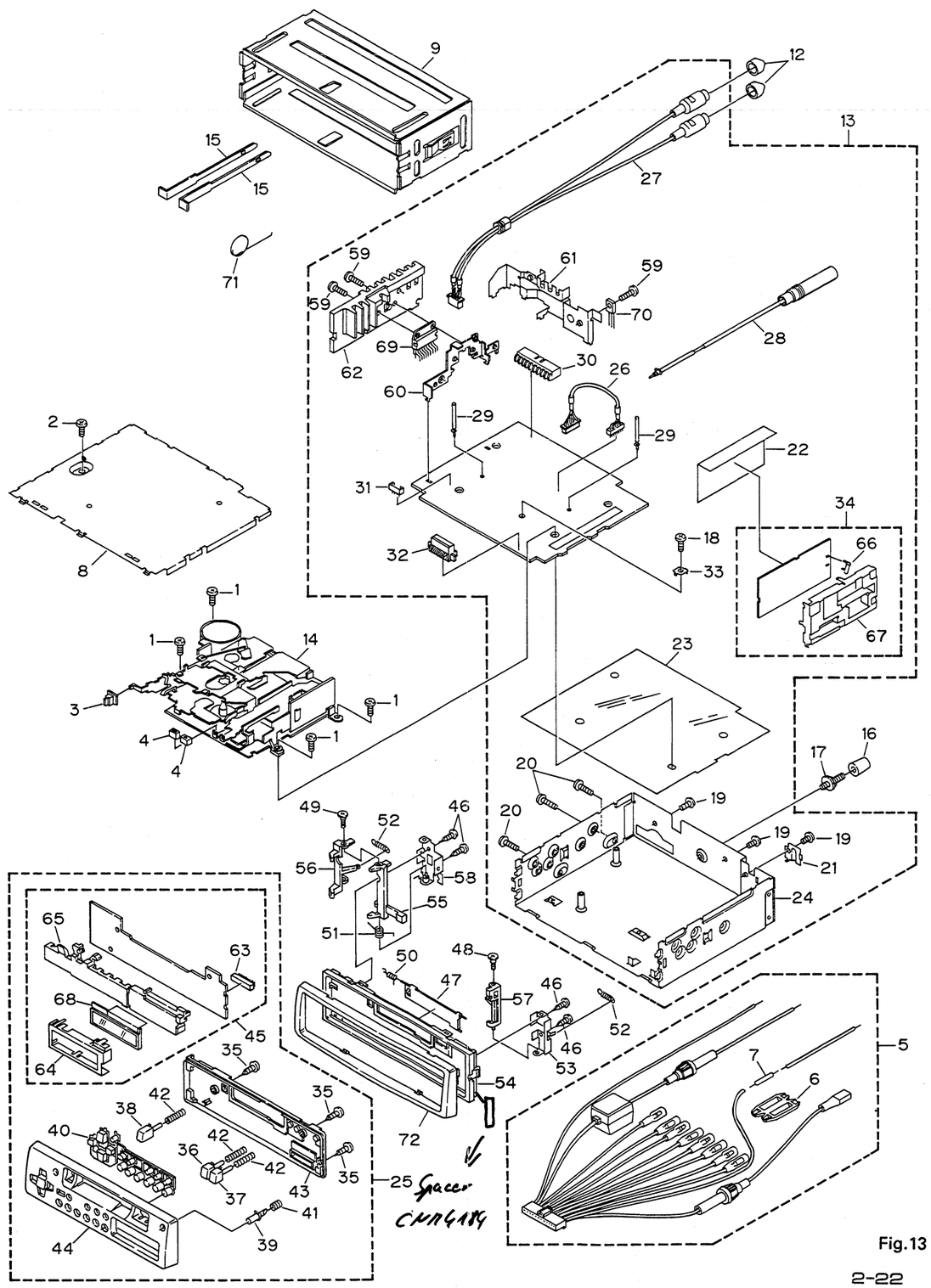


Fig.13

8

● **Cassette mechanism Assy(Parts List:Page 1-18)**

● **KEH-3600/UC,3650/ES,490/UC**

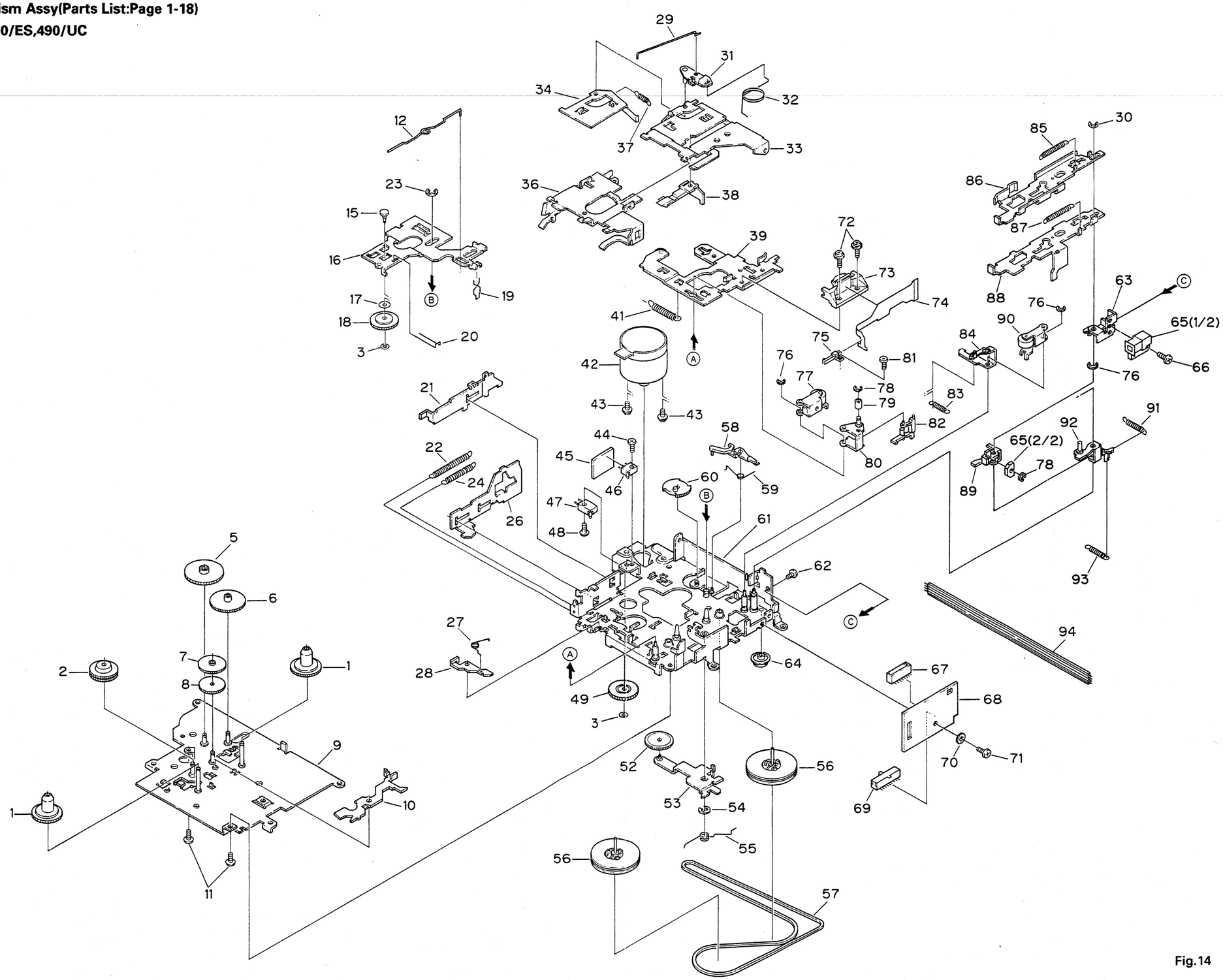


Fig.14

● **Cassette mechanism Assy(Parts List:Page 1-19)**

● **KEH-2600/UC,2650/ES,2403/UC**

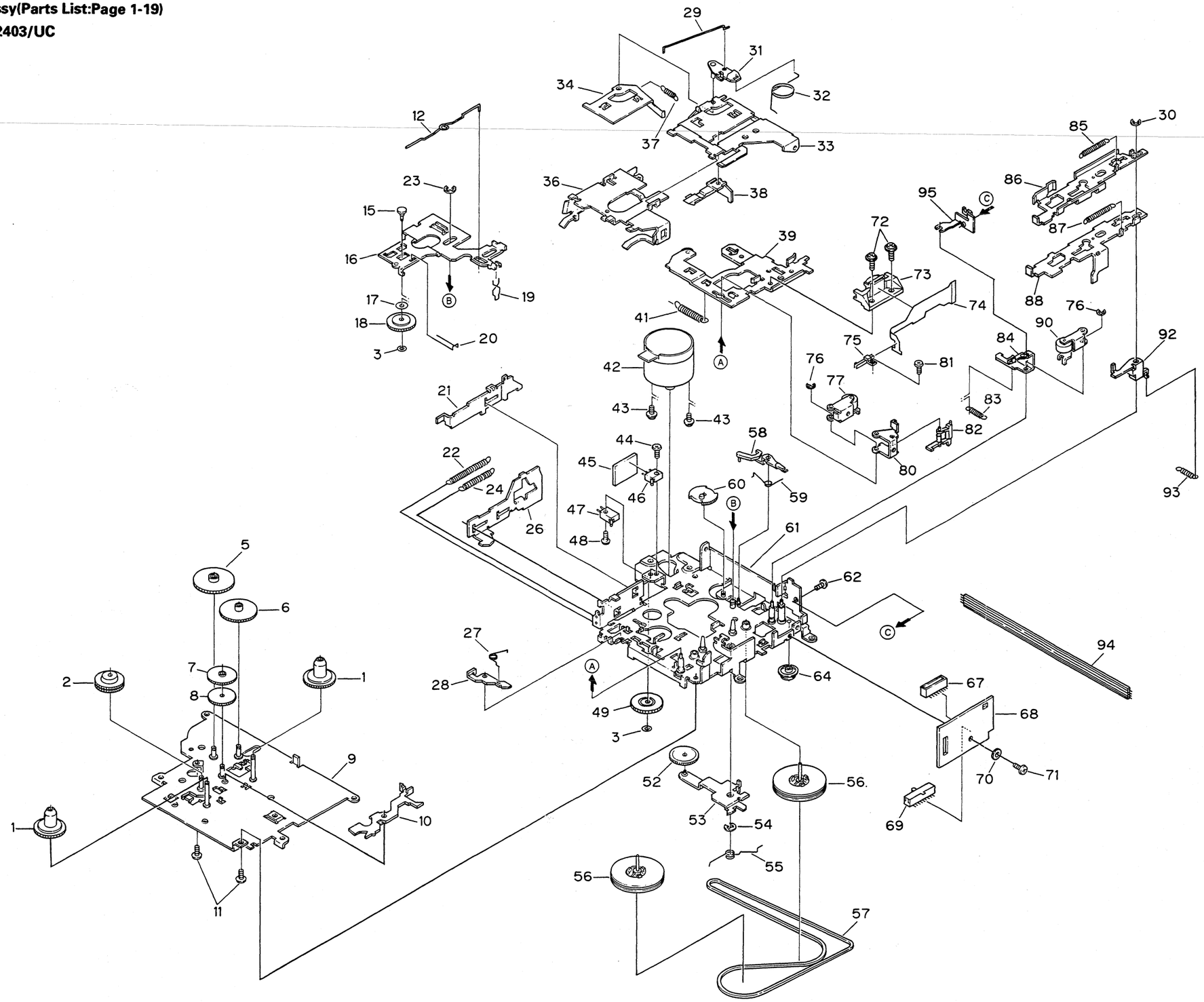


Fig.15

8. BLOCK DIAGRAM

● **KEH-3600/UC**

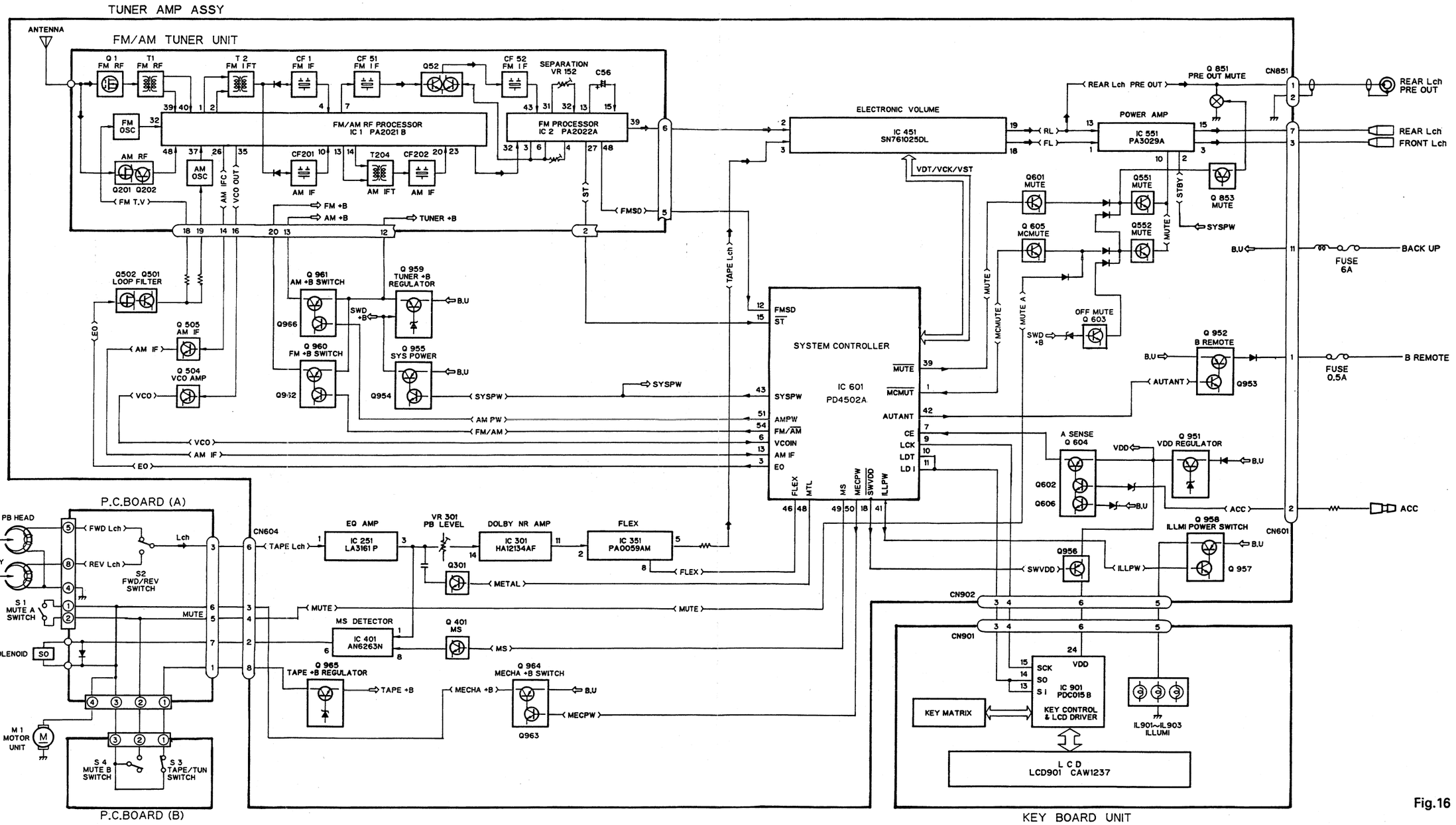


Fig.16